

Interdisciplinary Contributions to Archaeology

Elsa Yvanez

Magdalena M. Wozniak *Editors*

# Funerary Textiles in Situ

Towards a Better Method  
for the Study of Textile-related  
Burial Practices



Funded by  
the European Union

OPEN ACCESS



Springer

# **Interdisciplinary Contributions to Archaeology**

## **Series Editor**

Jelmer Eerkens, University of California, Davis, USA

## **Editorial Board Members**

Canan Çakırlar, University of Groningen, Groningen, The Netherlands

Fumie Iizuka, University of Wisconsin–Madison, Madison, WI, USA

Krish Seetah, Stanford University, Stanford, USA

Nuria Sugranes, Instituto de Evolución, Ecología Histórica y Ambiente,  
San Rafael, Argentina

Shannon Tushingham, California Academy of Sciences, San Francisco, USA

Chris Wilson, Flinders University, Bedford Park, Australia



Archaeology stands alone among the sciences in its attempt to enlighten us about the entire record of humankind. To cover such a broad range of time and space, archaeologists must ensure that their findings are integrated into broader spheres of scientific knowledge. The IDCA series aims to highlight the collaborative and interdisciplinary nature of contemporary archaeological research.

Topics the series has covered include:

- Paleoecology
- Archaeological Landscapes
- Statistical Approaches
- Laboratory Methods
- Human Biological and Cultural Evolution
- Human Nutrition
- Emergence of Agriculture and Pastoralism

For a copy of the proposal form, please contact Christi Lue ([christi.lue@springer.com](mailto:christi.lue@springer.com)). Initial proposals can be sent to the Series Editor, Jelmer Eerkens ([jweerkens@ucdavis.edu](mailto:jweerkens@ucdavis.edu)). Proposals should include:

- A short synopsis of the work or the introduction chapter
- The proposed Table of Contents
- The CV of the lead author(s)
- If available: one sample chapter

We aim to make a first decision within 1 month of submission. In case of a positive first decision the work will be provisionally contracted: the final decision about publication will depend upon the result of the anonymous peer review of the complete manuscript. We aim to have the complete work peer-reviewed within 3 months of submission.

This book series is indexed in SCOPUS.

For more information, please contact the Series Editor at ([jweerkens@ucdavis.edu](mailto:jweerkens@ucdavis.edu)).

Elsa Yvanez • Magdalena M. Wozniak  
Editors

# Funerary Textiles in Situ

Towards a Better Method for the Study  
of Textile-related Burial Practices

### Editors

Elsa Yvanez  
Centre for Textile Research, Saxo Institute,  
School of Archaeology  
University of Copenhagen  
Copenhagen, Denmark

Magdalena M. Wozniak  
Polish Centre of Mediterranean Archaeology  
University of Warsaw  
Warsaw, Poland



**Funded by  
the European Union**

This article/publication is based upon work from COST Action EuroWeb CA19131, supported by COST (European Cooperation in Science and Technology).

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation. [www.cost.eu](http://www.cost.eu)



ISSN 1568-2722                      ISSN 2730-6984 (electronic)  
Interdisciplinary Contributions to Archaeology  
ISBN 978-3-031-69460-8              ISBN 978-3-031-69461-5 (eBook)  
<https://doi.org/10.1007/978-3-031-69461-5>

This work was made possible through the following funders:

NAWA (Polish National Agency for Academic Exchange) - ULAM program PPN/ULM/2020/1/00246, 2021-2022

EuroWeb (COST action 19131)

The University of Warsaw (Open Access publication grant PSP-501-D353-20-7004310)

The European Union (ERC Fashioning Sudan, 101039416). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Council. Neither the European Union nor the granting authority can be held responsible for them.

© The Editor(s) (if applicable) and The Author(s) 2025. This book is an open access publication.

**Open Access** This book is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this book are included in the book's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the book's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Cover illustration: Wrapped human remains from tomb B520, Saqqara. Photograph taken by: Jarosław Dąbrowski, Polish-Egyptian Archaeological Mission Saqqara archive.

This Springer imprint is published by the registered company Springer Nature Switzerland AG  
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

If disposing of this product, please recycle the paper.

# Content Warning

The present volume discusses textiles in the framework of burial practices and the treatment of the dead, considering archaeological and ethnographic evidence from different cultural areas of the world.

Discussions include a wide range of topics related to death, the preparation of the deceased for burial, the decay of human bodies, and cultural beliefs surrounding mortality. Since the core of our analysis considers funerary gestures in which textiles intervene around the body, it was deemed by the editors necessary to show images of human remains. A rich illustration was thought especially useful in the *Protocol for the Excavation, Care, and In-Situ Analysis of Funerary Textiles*, in order to provide a truly helpful guide for practitioners. Photographs of human remains are therefore numerous in the present volume, showing both skeletonized and naturally mummified bodies.

Readers are advised that this content may be distressing for individuals sensitive to discussions about mortality and the viewing of human remains. Discretion is advised and readers are encouraged to approach the material with sensitivity and respect.

# Contents

<b>1</b>	<b>Funerary Textiles In Situ: Archaeological Perspectives . . . . .</b>	<b>1</b>
	Elsa Yvanez and Magdalena M. Wozniak	
<b>Part I Aspects of Theory and Methods</b>		
<b>2</b>	<b>Theoretical Approaches to the Functions of Textiles in Graves . . . . .</b>	<b>27</b>
	Karina Grömer	
<b>3</b>	<b>Fabrics and Funerals: An Ethnographic Enquiry . . . . .</b>	<b>53</b>
	Estella Weiss-Krejci	
<b>Part II Case Studies in Europe and the Nile Valley—Textiles on Bodies</b>		
<b>4</b>	<b>Silk Textiles in Funerary Liturgical Garments in Poland (Seventeenth to Nineteenth Centuries) . . . . .</b>	<b>79</b>
	Dawid Grupa	
<b>5</b>	<b>Research on Post-medieval Funerary Attire: Ethics, Challenges, and Successful Methods for Studying Coffin Textiles Found Below Finnish Church Floors . . . . .</b>	<b>97</b>
	Sanna Lipkin	
<b>6</b>	<b>Textiles and Bones on Site: A First-Hand Experience from the Cemeteries at Naqlun (Egypt) and Crypts at Old Dongola (Sudan) . . . . .</b>	<b>117</b>
	Barbara Czaja and Robert Mahler	
<b>7</b>	<b>Grave Concerns: The Complexity of Recovery, Documentation, and the Study of Funerary Textiles from Ancient Egyptian Inhumations at Saqqara . . . . .</b>	<b>137</b>
	Iwona Kozieradzka-Ogunmakin	

### **Part III Case Studies in Europe and the Nile Valley—Textiles Separated from Bodies**

- 8 Wrapping Practices in Medieval Sudan: Case Studies from Gebel Adda** . . . . . 167  
Magdalena M. Wozniak
- 9 Conservation Approaches for Pyre-Burial Textiles Excavated in Greece** . . . . . 205  
Christina Margariti, Stella Spantidaki, Maria Kinti, and Tina Chanielaki
- 10 The Stronghold Has Become a Grave: Preliminary Analysis of Fabrics from Early Medieval Trzcianka, Janów Commune, Poland** . . . . . 221  
Małgorzata Grupa and Tomasz Kozłowski

### **Part IV Case Studies in Europe and the Nile Valley—Absent Textiles**

- 11 Funerary Textiles in the Prehistoric Aegean: A Case of Two Mycenaean Textile Imprints from Tomb XXI at Deiras, Argos** . . . . . 235  
Małgorzata Siennicka
- 12 Naked Graves? Thoughts on the Recording and Reconstruction of Funerary Attire in the Early Iron Age of Southwestern Iberia** . . . . . 253  
Francisco B. Gomes

### **Part V Tools for the In Situ Analysis of Funerary Textiles**

- 13 Protocol for the Excavation, Care, and In Situ Analysis of Funerary Textiles in Arid Contexts: Perspectives from Ancient Sudan and Egypt** . . . . . 279  
Elsa Yvanez and Valentina Turina

**Glossary of Terms Relative to Funerary Textiles in Archaeology** . . . . . 333

**Historical Periods Index** . . . . . 341

**Textile-Related Terms Index** . . . . . 343

**Funerary Aspects Index** . . . . . 345

**Geographical Locations Index** . . . . . 347

**Names Index** . . . . . 349

## About the Editors

**Elsa Yvanez** is an archaeologist specialised in the textile production of ancient Sudan and Nubia, in the chaîne opératoire and economic significance of spinning and weaving, as well as in the use of textiles for clothing and burial. After a Marie-Skłodowska Curie fellowship (TexMeroe, MSCA 743420), she conducted the *Unravelling Nubian Funerary Practices* project at the Polish Centre of Mediterranean Archaeology, University of Warsaw. She is currently employed as an associate professor at the Centre for Textile Research/Saxo institute, at the University of Copenhagen, where she is leading the 5-year research project *Fashioning Sudan. Archaeology of dress practices along the Middle Nile* (ERC StG 101039416). In parallel, she is also acting as a textile specialist for several excavation teams working in Egypt. She is member of EuroWeb's working group 1 (Textile technologies) and 2 (Clothing Identities).

**Magdalena M. Wozniak** is a researcher at the Polish Centre of Mediterranean Archaeology, University of Warsaw. Her research focuses on textile production, cloth consumption and the role of textiles in the visual expression of identity in medieval Sudan. She holds a PhD in Archaeology from Paris-Sorbonne University. In 2016–2019 she was awarded a POLONEZ post-doctoral grant from the National Science Centre, Poland, and a Marie Skłodowska-Curie grant from the European Union's Horizon 2020 research and innovation programme for the project "Nubian Textiles: Craft, Trade, Costume and Identity in the Medieval Kingdom of Makuria". She is leader of EuroWeb's working group 2 – Clothing Identities: Gender, Age and Status.

# Chapter 1

## Funerary Textiles In Situ: Archaeological Perspectives



Elsa Yvanez and Magdalena M. Wozniak

### 1.1 Introduction

Despite the apparent rarity of organic remains in archaeology, textiles were an omnipresent type of material in past societies, their flexible and versatile nature making them essential to many activities, from the packing of goods to the transport of things and people, from clothing the living to wrapping the dead. In funerary contexts especially, textiles played a prominent role; very rare are societies that bid farewell to their dead without providing them with clothing or covers of some sort. Textiles were and continue to be used to hide the body of the deceased, and to recreate it into a “deceased” (Crubézy, 2019; Yvanez, 2023). This prominent role is well illustrated in modern practices across the globe and in ethnology, but often disregarded in archaeology. The obstacles can be manifold: a lack of expertise on site, the perceived complexity of textile materials, their rare or—in the other extreme—plentiful preservation, a lack of time or dedicated facilities and budget for their study... For many reasons, funerary textiles are rarely recorded *in situ* in the burials; they are often separated from the human remains, stored in different locations, and studied and published by different specialists at different times. We are thus destroying precious evidence and limiting our understanding of funerary events. How was the body prepared before the funeral? How was it seen and perceived by its relatives

---

E. Yvanez (✉)

Centre for Textile Research, Saxo Institute, School of Archaeology,  
University of Copenhagen, Copenhagen, Denmark  
e-mail: [elsa.yvanez@hum.ku.dk](mailto:elsa.yvanez@hum.ku.dk)

M. M. Wozniak

Polish Centre of Mediterranean Archaeology, University of Warsaw, Warsaw, Poland

© The Author(s) 2025

E. Yvanez, M. M. Wozniak (eds.), *Funerary Textiles in Situ*, Interdisciplinary Contributions to Archaeology, [https://doi.org/10.1007/978-3-031-69461-5\\_1](https://doi.org/10.1007/978-3-031-69461-5_1)



and the community? What role did textiles play in its metamorphosis into a deceased person?

The present volume aims to explore these questions by bringing together a highly specialized team of experts from the fields of bio-archaeology and textile research, including archaeologists, anthropologists, and conservators. The contributions presented here are the results of a two-day workshop organized by the present authors at the University of Warsaw in 2021.<sup>1</sup> Our geographical focus is the ancient Nile Valley (Egypt and Sudan) and Europe; two regions that offer very diverse climatic and environmental conditions, and therefore different opportunities and challenges for the preservation and study of funerary textiles. We also cover a long historical period, from prehistory to early modern times. Going beyond this geo-historical framework, this volume strives to build new methods for the study, retrieval, and conservation of funerary textiles *in situ* on the body of the deceased.

Today, excavations in waterlogged and desert areas continue to yield textiles from funerary contexts, but recent finds are not the only possible source of enquiry. Museums and excavation storage magazines are already full of archaeological textiles from cemeteries excavated during the 19th and 20th centuries, which are still awaiting study. Mostly, these textiles have become disconnected from the bodies that they were used to wrap and the archaeological contexts to which they belonged. It is therefore important to integrate this material into our present reflections, as precious information about burial practices can still be gathered from cross-referencing textile analyses and excavation archives. In the case of ancient Egyptian and Sudanese textiles, *a fortiori* when stored in Western museums, investing in research and publication of these legacy collections is particularly needed to address post-colonial imperatives, and to offer access to objects that are currently unavailable due to ongoing conflicts.

After exploring the potential and limitations of archival approaches, this paper will review the developments of research on funerary textiles and highlight current directions and methods in different environmental conditions, as exemplified in the present volume.

## **1.2 In Favour of an Archival Approach: The Potential and Limitations for the Study of Funerary Textiles *In Situ*—Example from Tomb 350/II at Debeira, Lower Nubia**

A good illustration of the importance of archival approaches is provided by the study of funerary textiles excavated in Lower Nubia during the UNESCO salvage campaign of the 1960s. The hyper-aridity of the region and the thoroughness of the

---

<sup>1</sup> Online workshop hosted at the Polish Centre for Mediterranean Archaeology (PCMA), University of Warsaw, on 15–16 April 2021, by the present authors. The workshop was supported by Elsa Yvanez's project *Unravelling Nubian Funerary Practices* (Ulam programme, Polish National Agency for Academic Exchange, PPN/ULM/2020/1/00246) and by the *EuroWeb* COST action (CA19131).

archaeological coverage, conducted along large survey areas on both banks of the Nile, have created an extremely large corpus of funerary textiles (e.g. Bergman, 1975; Mayer-Thurman & Williams, 1979). A particularly rich assemblage is the one gathered during the Scandinavian Joint Expedition to Nubia (SJE), which uncovered more than 490 sites between 1961 and 1964, along a 60 km portion of the eastern bank of the Nile. More than 6000 textiles were excavated from Late Antique funerary sites and brought to Sweden for conservation and storage.<sup>2</sup> Studied and published in 1975 by the textile scholar Ingrid Bergman, this collection is undoubtedly one of the better-known textile assemblages from Nubia. Today, the material is housed at the Gustavianum Museum, at the University of Uppsala, together with a large part of the excavation archives. At the time, the SJE team had a well-developed excavation and recording process, which, despite being severely limited in terms of manpower and time for such a large survey area, led to the creation of a rich body of archives, including detailed notes, drawings, and photographs documenting the findspots of the textiles. The photographs in particular are crucial to understand the great diversity of wrapping practices, a set of gestures that is now invisible on the textiles themselves since they have been washed and spread out flat. These documents make it possible to readdress the collection and cross-reference information to attempt a reconstruction of the wrapped burials.

Here, we will focus on the textiles retrieved from a single inhumation located at the northern end of the Debeira plain on site 350, grave 350/II (Säve-Söderberg, 1981: 130–131; Bergman, 1975: 81–82). This grave is typical of many of the single inhumations excavated by the SJE and does not stand out by the richness of its assemblage nor its archaeological treatment. In fact, the entirety of cemetery 350—12 funerary structures constructed c. 300 m from the river—was deemed by the excavators to be “rather small and unimportant” (the site was excavated in March 1963 by the Swedish archaeologist Gunborg Ohlson; this description was reported by Säve-Söderberg in Hellström et al., 1970: 20). However, we believe that this particular grave offers a good case study to test the potential and limitations of such an archival approach, as it was found undisturbed, was fairly well documented at the time of excavation but not exceptionally so, and all the relevant textiles are available for study at the museum. As the study of this textile assemblage progressed, it quickly became apparent that merging archives and artefacts pushed our reflections significantly beyond this single structure. Instead, it opened up multi-layered stories: the story of the deceased themselves, the story of the artefacts (including the story of the textiles’ manufacture and uses), the story of the burial rites and funeral, the story of the archaeological excavation, the story of the museum life of the objects and archives, and ultimately that of our current research. The following paragraphs will focus on the aspects relating to the textiles and the burial.<sup>3</sup>

---

<sup>2</sup>A small number of textiles are also part of the Sudan National Museum’s collection.

<sup>3</sup>More information about Grave 350/II can be found in the specially designed online archive “Re-excavating SJE 350-II”, at <https://nubianburial.ku.dk/> (consulted 17-02-2024).

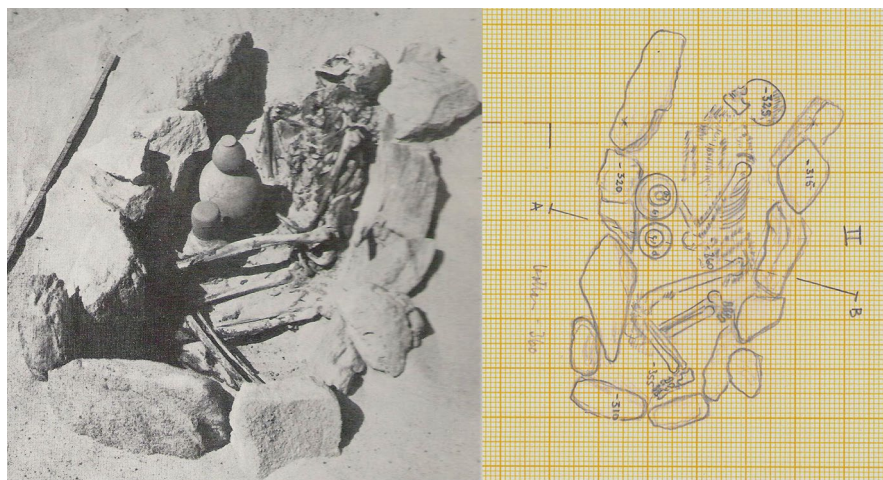
### 1.2.1 *The Burial (Fig. 1.1)*

Grave 350/II had a superstructure of stone slabs laid over a shaft, itself lined with stones. It was oriented NW–SE, measured 1.60 m long by 95 cm wide, and was 1 m deep. Inside the shaft, the burial was found undisturbed; on the drawn plan and photograph, we see a body in contracted position laying on its right side, in a skeletonized state. The present authors have been unable to locate the skeleton at the University of Copenhagen, which today houses a selection of the SJE collection of human remains. It was presumably reburied on site, which precludes any identification of sex and age.<sup>4</sup> In front of the body's thorax, the records show there was a set of ceramics. A series of blurry hatches and darker areas also indicate the presence of textile remains.

The grave was dated to the Post-Meroitic period, c. 400–600 CE, on the basis of the pottery (see below, Säve-Soderberg, 1981: 130).

### 1.2.2 *The Artefacts*

The excavation report and the final publication are both very succinct in their description of these artefacts: “pottery in front of the body, textiles on different parts of the body” (Säve-Soderberg, 1981: 130). The photograph shows four vessels: two



**Fig. 1.1** Photographic view and plan drawing of grave 350/II, at Debeira. (Scandinavian Joint Expedition to Nubia, reproduced with the authorisation of the Gustavianum, Uppsala University Museum)

<sup>4</sup>Parts of the human remains were studied by Ole Vagn Nielsen and published in volume 9 of the *Scandinavian Joint Expedition* series (Nielsen, 1970).

bottles and two drinking vessels arranged in two sets. The goblet was turned over the mouth of the larger bottle, and the cup over the mouth of the smaller one, in an arrangement well known in Meroitic and Post-Meroitic burials (Francigny, 2016: 104). The ceramics were the only artefacts recorded in the site inventory, while the other artefacts, made of organic material, did not receive a registration number and were not specified on the tomb drawing.

The museum collection, however, contains four different textiles listed as coming from this grave, as well as another group of objects that appeared in neither the report nor the publication. They consist of leather fragments (narrow strips and a wider one with diamond decoration) and a group of very degraded materials (leather or wood?) damaged by termites. They could have come from a kind of container (?) or were perhaps misattributed to this inhumation. The textiles, on the other hand, correspond well to the dark surfaces visible on the tomb records over the body.

### 1.2.3 *The Textiles*

A minimum of four different textiles are associated with the burial of this individual, numbered 350/II.x, 350/II.A, 350/II.B, and 350/II.C. Today, they are all fragmented and sometimes very desiccated, but together, they offer a good sample of the range of ancient Nubian textile craft. They were studied in 2018 by the present authors and documented through a complete textile analysis (Figs. 1.2, 1.3, 1.4, and 1.5).<sup>5</sup>

- 350/II.x. Group of 33 fragments, made of wool, possibly dromedary wool.<sup>6</sup> This textile is rather simple in its construction and typical of Nubian fabrics: an open tabby weave with two horizontal bands at the bottom (made of reddish-purple and pale yellow-coloured wool, today very much decayed), finished by a strong corded edge and bordered by reinforced selvages. One interesting aspect of this textile is the large knot preserved on one of the corner fragments, which could have fastened the textile around the body.
- 350/II.A. Group of 43 fragments, comparatively much thicker than the others, showing a simple tabby weave made of sheep (?) wool. It has a braided starting border, embroidered lateral edges (selvages) in dark blue and brown thread, and a lower border with short, dark brown tassels. It was knotted at the corners.
- 350/II.B. This piece is preserved as two large fragments made in a dense tabby weave and light-colour sheep (?) wool fibres. The corners of this item were deco-

<sup>5</sup>The full photographic documentation can be accessed via <https://nubianburial.ku.dk/collections/show/2> (consulted 17-02-2024).

<sup>6</sup>Fibre identification was carried out during Ingrid Bergman's study (Bergman, 1975, 11: 81–82) but remains hypothetical. Proteomic analyses, under way as part of the Fashioning Sudan project (ERC 101036416), will hopefully clarify this point.

Fragmented textile_shroud?		Museum	Gustavianum Museum, Uppsala		Date	Late Meroitic-Postmeroitic	
Site		Debeira, Neg' Iryan		Inv. N°	350/II.A		

Context type

funerary

Cemetery 350, grave II.  
Undisturbed inhumation, sex/gender non-identified. 4 textiles in total found in the grave.

Fibre & Thread

Cat.	animal	Primary twist	S
Type	wool	Diam. (mm)	0,55
Source	sheep	Warps	13
		Wefts	n.a.
		Notes	

Weave

Type	Tabby 1/1	Threads /cm		Ground weave		Featured area	13 warps x 5 wefts
Selvedge		Edge_looped		Edge_unlooped		Fringes	
Simple_C1		A8		B3		X	

Max. dimensions (mm)

Frgt. A	H: 130	W: 200
Frgt. B		

Decor

Patterns	Lines and hatches
Technique	Embroideries, fringed tassels, weft-patterning
Colors	Natural, light and dark brown, dark blue

Description


Group of 43 fragments belonging to the same piece. One of the corners is still knotted and maintained by the prolongation of the lower edge cord, which could have been used as an attachment for clothing or for the shroud (?). The weave is distended in several portion but warp-faced and well preserved along the selvages (see thread count).

Upper edge: Thick braid of intertwined supplementary wefts, incorporating a plied thread (S2Z) used as an anchor for the looped warps (type A8).

Lower edge: Bicolor braid of supplementary wefts, blue and light brown (natural color?), thicker and plied S2Z. The edge is completed by a row of short fringed tassels (type B3), attached to a loop formed by the warp ends, regrouped and knotted together.

Selvedge: Simple (type C1). Decorated by continuous and regular embroidery: buttonhole stitches in plied threads (S2Z), dark blue along one selvedge, dark brown along the other one.

Conservation assessment: Desiccated and brittle. Better preserved along the tasseled border.









Bibliography

Bergman I. 1975. *Late Nubian Textiles*, SJE 8, Scandinavian University Books, p. 81.

Image source

Photos Elsa Yvanez, courtesy of the Gustavianum Museum.





©Elsa Yvanez

**Fig. 1.2** Textile report on textile 350/II.A. Photographs reproduced with the authorisation of the Gustavianum, Uppsala University Museum. (Image Elsa Yvanez)



Garment with <i>gammatia</i>		Museum	Gustavianum Museum, Uppsala		Date	Late Meroitic-Postmeroitic	
Site		Debeira, Neg' Iryan		Inv. N°	350/II.B		

Context type

funerary

Cemetery 350, grave II.  
Undisturbed inhumation, sex/gender non-identified. 4 textiles in total found in the grave.

Fibre & Thread

Cat.	animal	Primary twist	S
Type	wool	Diam. (mm)	1,23
Source	sheep	Warps	0,88
		Wefts	
		Notes	

Weave

Type	Tabby 1/1	Threads /cm	6 warps x 5 wefts	Ground weave	6 warps w 20 wefts	Featured area
Selvedge	Warp bundles_C2	Edge_looped		Edge_unlooped	Fringes_B1	Fringes X

Max. dimensions (mm)

Frgt. A	H: 300	W: 710
Frgt. B	H: 490	W: 490

Decor

Patterns	Stripes, <i>gammatia</i> ( <i>eta</i> ), stripped effect (warp dir.)
Technique	Tapestry, weft patterning
Colors	Natural, dark brown, blue

Description

2 large textile fragments belonging to the same piece, probably a reused garment such as a mantle. These fragments come from the lower part of the piece.

Lower edge: simple, with free-hanging fringes (type B1). The fringes are preserved up to 55 mm long.


Selvedge: Reinforced with 3 warp bundles (type C2), with 2 warp threads each.

The lower part of the fabric is decorated by a succession of thin stripes: 2 blue picks, 2 natural picks, 2 blue picks, c. 7 natural picks in regular tabby. The corner of the piece, as well as other portions close to the selvedge, also show the use of supplementary wefts of dark brown wool, which do not run through the entire width of the fabric but turn back into the weave in successive returns.

Rectangular *gammatia* (*eta*) with notches, c. 10 cm high and 23 cm wide. Notches: 2 cm deep, 2-9 mm wide. Dovetailing tapestry between two different color zones, where wefts of different colors turn over the same warp. Generally, the execution is unequal: the blue dye does not look to have penetrated the threads homogenously, which creates a sort of shading through the *eta* figure. Located at c. 18 cm from the selvedge.

The second fragment also show a stripped effect created by the use of different warp threads. It is not very visible during close examination, but becomes rather evident from a distance.

Conservation assessment: generally well preserved, good fiber integrity and still flexible.



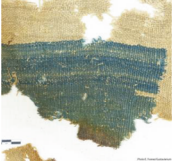



Bibliography


Bergman I. 1975. *Late Nubian Textiles*, SJE 8, p. 81.;  
Szymaszek M. 2015, 2017.


Image source


Photos Elsa Yvanez, courtesy of the Gustavianum Museum.




















©Elsa Yvanez

Fig. 1.3 Textile report on textile 350/II.B. Photographs reproduced with the authorisation of the Gustavianum, Uppsala University Museum. (Image Elsa Yvanez)

Polychrome tapestry		Museum	Gustavianum Museum, Uppsala		Date	Late Meroitic-Postmeroitic	
Site	Debeira, Neg' Iryan		Inv. N°	350/II.C		380-540 CE (calibrated C14)	

Context type

funerary

Cemetery 350, grave II. Undisturbed inhumation, sex/gender non-identified. 4 textiles in total found in the grave.

Fibre & Thread

Cat. animal

Type wool

Source dromedary?

Primary twist S

Diam. (mm)

0,62

0,83

Notes

weft: very light spun

Weave

Threads /cm

Ground weave

Featured area

Type

Tapestry

5 warps x 20 wefts

-

Selvedge

Edge\_looped

Edge\_unlooped

Borders

-

-

-

Fringes

-

Max. dimensions (mm)

Frgt. A

H: 140

W: 170

Frgt. B

Decor

Patterns

Frieze of floral motives, crenellated lines

Technique

Tapestry

Colors

Light brown, dark blue, light greenish blue

Description

Group of 160 fragments, usually very small in size and all belonging to the same piece. The preserved fragments only show portions of weave with an elaborate tapestry décor. In the current state of preservation, it is impossible to assess if the complete textile was entirely covered by this décor, or contained a large area of plain ground weave with a horizontal tapestry band in selected portions. The use of warp pairs (rather rare) would tend to support the 1<sup>st</sup> hypothesis: a thick fabric in floral tapestry patterns, closer to furnishing than clothing use (?).  
The warp is formed by pairs of tightly spun threads, while the wefts are very lightly spun.  
The décor shows a frieze (or several?) with floral patterns, alternating greenish-blue lotus flowers and palmettes, on a dark blue ground. The patterns are delineated by a light-color line (of natural light brown wool?). Each pattern starts on a rectangular base with long 'teeth', resembling a comb of sort. The lotuses are topped by small ovals representing the flower's stamen.  
The floral frieze is lined by a light brown crenellated line topped by small lozenges.  
A similar frieze of lotus and palmettes is also known at Qasr Ibrim (BM 72268), created in a similar color palette but made of cotton. The comb-like base of the flowers recalls patterns painted on Meroitic fine ware ceramics.  
Conservation assessment: Desiccated and very brittle. Looks carbonized in many places. The fibers are very much degraded.



Bibliography

Bergman I. 1975. *Late Nubian Textiles*, SJE 8, Scandinavian University Books, p. 81.

Image source

Photos Elsa Yvanez, courtesy of the Gustavianum Museum.



TEXIMEROE



©Elsa Yvanez

**Fig. 1.4** Textile report on textile 350/II.C. (Photographs reproduced with the authorisation of the Gustavianum, Uppsala University Museum. Image Elsa Yvanez)

Fragmented textile_shroud?		Museum	Gustavianum Museum, Uppsala		Date	Late Meroitic-Postmeroitic	
Site		Debeira, Neg' Iryan		Inv. N°	350/II.x		

Context type

funerary

Cemetery 350, grave II.  
Undisturbed inhumation, sex/gender non-identified. 4 textiles in total found in the grave.

Fibre & Thread

Cat.	animal	Primary twist	S
Type	wool	Diam. (mm)	0, 76
Source	dromedary?	Notes	

Weave

Type	Tabby 1/1, with weft-faced stripes	Threads /cm	8 warps x 7 wefts	Ground weave		Featured area	8 warps x 13 wefts
Selvedge		Edge_looped		Edge_unlooped		Fringes	
Borders		Warp bundles_C2		Simple_A1		Cord_B9	

Max. dimensions (mm)

Frgt. A	H: 310	W: 600
Frgt. B		

Decor

Patterns	Polychrome bands
Technique	Weft-faced
Colors	Natural, purple/red, yellow?

Description

Group of 33 fragments belonging to the same piece. One of the corners is still knotted, which could indicate the use of the piece as a shroud. Several small fragments stored with the other textiles could also belong to this piece (1 fgt. of reinforced selvedge type C2, very similar, as well as 2 tiny fgts. of a simple upper edge type A1).  
Weave: Rather loose and open, with a tendency to be warp-faced in better preserved sections. The warps seem slightly thicker than the wefts.  
Lower edge: finished by a complex braid made with the warp threads, then by a thick cord (type B9).  
Selvedge: reinforced with 3 warp bundles (type C2).  
Along the lower edge, the bottom of the ground weave was decorated by a thick double band alternating purple/red and yellow colors. The wool used in the bands has deteriorated, the purple/red one is almost entirely gone. The yellow (or natural color of another wool type?) is slightly better preserved.

Conservation assessment: Very decayed, with large areas of carbonised fibers. The purple/red hue of the dye has completely disappeared in entire sections (not even visible with x200 magnification).




Bibliography

Bergman I. 1975. *Late Nubian Textiles*, SJE 8, Scandinavian University Books, p. 81.

Image source

Photos Elsa Yvanez, courtesy of the Gustavianum Museum.








Fig. 1.5 Textile report on textile 350/II.x. (Photographs reproduced with the authorisation of the Gustavianum, Uppsala University Museum. Image Elsa Yvanez)



rated by either a *gamma* or *eta* figure,<sup>7</sup> in blue tapestry. The decoration, as well as the weaving techniques, are reminiscent of the Late Antique mantles and tunics in use across the whole Mediterranean basin at the time, and adopted in Nubia as well since the end of the Meroitic Period (Yvanez, 2018).

- 350/II.C. This piece is a thick textile made of wool, maybe dromedary wool (?), very fragmentary and brittle. It seems to have been entirely covered by polychrome tapestry patterns with friezes of floral motifs (lotus flowers and palmettes) flanked on the side by a crenelated line. Even in its present state, it is an exceptional piece, with only one known parallel in the shape of a small isolated fragment from the Lower Nubian settlement of Qasr Ibrim (British Museum 72268<sup>8</sup>). The construction of the pattern, as well as the thickness of the fabric (constructed with pairs of warp threads), indicate that the primary function of the textile was perhaps not for clothing but rather soft furnishings, such as a type of blanket that could also be used as an outer wrap. Dye analyses have shown the use of indigo dye for both the light and dark blue shades, made possibly with woad (*isatis tinctoria*) (Yvanez et al., 2025).

Textile 350/II.C was sampled and dated via radiocarbon analysis, placing the manufacture of the textile—and potentially the date of the inhumation itself—in the chronological bracket 380–540 CE, with a higher probability during the first half of the Post-Meroitic Period.<sup>9</sup>

Combined with the other elements of the grave, the study of the textiles shows that, despite the seemingly poor appearance of the burial, its furnishing still mobilized a rather significant quantity of resources and skills. The textiles form a picture in which local Kushite techniques and ornaments merged with Hellenistic influences, being combined in a group of blue, beige, and brown fabrics wrapping the body. While they were assembled together for the burial, it is highly probable that at least several of them were also used as clothing during the lifetime of the individual. Made of different types of wool and dyed fibres, they point towards the past economy of textile production. The skills involved in their realization, especially for the tapestry piece 350/II.C., would have made them valuable possessions, providing an interesting window into the cultural and economic landscape of the region.

<sup>7</sup>These types of Hellenistic patterns were widely used in Lower Nubia at the time and are well represented in the SJE corpus (Bergman, 1975, 51; Szymaszek, 2015).

<sup>8</sup>[https://www.britishmuseum.org/collection/object/Y\\_EA72268](https://www.britishmuseum.org/collection/object/Y_EA72268) (consulted 17-02-2024), in cotton.

<sup>9</sup>The dating was carried out with radiocarbon analysis at the Poznan Radiocarbon Laboratory (Adam Mickiewicz University), on a sample from SJE 350/II.C, calibrated with the OxCal software, OxCal v4.2.3. Results: 68.2% probability: 391 CE (37.1%) 433 CE; 462 CE (1.7%) 466 CE; 489 CE (29.4%) 532 CE; 95.4% probability: 350 CE (2.9%) 367 CE; 380 CE (92.5%) 540 CE.

### 1.2.4 *Reconstructing the Body Wrappings—Hypotheses and Discussion*

However, unfortunately for our present research question, the location of the different textiles were not mapped on the body at the time of excavation. They were not even inventoried, which tends to indicate that they were not considered as true “burial goods”, but rather thought of as a part of the inhumation itself, associated with the human remains. Consequently, we cannot know if some textiles were found on selected parts of the body, or if all of them covered the whole individual. We also do not know the succession of the different textile layers as arranged during the preparation of the body. The “story of the burial” is therefore very incomplete: without the skeleton, we cannot tell the story of the individual, and without the textiles’ precise contextual information, we cannot reconstruct the textile gestures that occurred during the burial rites. All we can do is hypothesize.

Going back to the drawing and tomb photograph, we see that textiles were observed on the skull, the thorax, the back, and the pelvis, as well as on the lower legs; it seems that most of the body (if not all) was covered and hidden from view. By comparison with other contemporary inhumations discovered in this region with well-preserved textiles (e.g. Bergman, 1975: pl. 6), and because four different fabrics were found in grave 350/II, we can infer that this inhumation would have presented a rather voluminous bundle. We can hypothesize that the body was first wrapped in two fabrics, each knotted at the corners, perhaps the thinner one (350/II.x) being placed directly on the skin. The fragmentary and brittle state of this particular fabric, and the extensive staining visible in many areas, tend to confirm its close proximity to the body. Then, the body thus wrapped could have been covered (or wrapped again) in the very large fabric of a (reused?) mantle, decorated with blue tapestry figures. The thick tapestry fabric, with its rows of lotus flowers and palmettes, could then have been placed on top of the body—to be visible to all during the funeral—or instead under the body—to provide a sort of funerary “bed” for the deceased. Either way, the funerary deposit would have presented a much more colourful and voluminous appearance than that suggested by the denuded skeleton visible in the stark black and white photograph.

Still, despite a meticulous examination of the archives and the textiles, many questions are still pending:

- Where was each textile fragment found? On or under the body? On which area of the body?
- Was the body dressed and wrapped or only wrapped?
- What was the sequence of wrappings? Did it have a meaning within the funerary rites?
- What was the final appearance of the body during the funeral?

Many of these questions could have been answered with more precise recording during the excavation of the grave, and if a dialogue between the archaeologist, anthropologist, and textile expert had occurred. The delays between excavation and

expert material studies, as well as a siloed approach to research and publication, did not create an arena conducive to the multi-disciplinary interpretation of the burial. This specific case study highlights the need for a holistic approach to burials and the construction of a shared methodology before and during the excavation. Similar limitations are underlined in the present volume by Magdalena M. Wozniak, on the basis of the early Medieval textiles from another Nubian cemetery, Gebel Adda, excavated in 1963–1967. Her article reveals the crucial role of textile analysis and the mapping of each textile's location for the reconstruction of burial gestures. Research carried out in archives and museum collections can clearly teach us plenty about past practices, but the many limitations seeping through a decades-long gap between excavation and textile study may prove ultimately impossible to overcome.

### 1.3 Funerary Wrappings—Past and Present Discussions

As it is often the case in archaeology, textile research has developed very differently in Europe and in the Nile Valley, conditioned as it is by the local conditions of preservation and the resulting quantity of material available. In temperate European environments, the general conditions of humidity and biologically active soils have not been—to a large extent—favourable to the conservation of organic remains. Discoveries of archaeological textile remains are therefore rare, and the material tends to be valued. In exceptional conditions, such as in the Bronze Age barrow burials or the Iron Age waterlogged bog burials of Denmark for example, the preservation of funerary textiles is astonishing. Entire sets of attire can then be reconstructed, and their study sheds light on the rich textile craft and economy of the times. Scholarly interest in this material blossomed from the 1930s onwards, especially through the work of textile pioneer Margrethe Hald (her 1950 PhD dissertation was translated in 1980 under the title *Ancient Danish Textiles from Bogs and Burials*, Hald, 1980). The same textiles continue to fuel innovative research today, e.g. the textiles found on the 'Huldremose woman' (Gleba & Mannering, 2010; Vanden Berghe et al., 2009), or with the deceased in the oak coffins of Borum Eshøj and Muldbjerg (Mannering et al., 2012; Frei et al., 2017; Harris, 2014).<sup>10</sup> In the case of the renowned 'Egtved girl', the textiles, the hair, some teeth, and other parts of her attire were the only preserved parts of her body, the bones having completely decayed because of the acidic conditions prevailing in the soil and oak coffin (Frei et al., 2015; Bergerbrant, 2019). The textiles become, then, the closest archaeologists can get to the deceased individual. To this day, after multiple different research phases, the textiles and human remains are exhibited together, surrounded by the other elements of the burial, in the galleries of the National Museum of Denmark.

---

<sup>10</sup> See for example <https://en.natmus.dk/historical-knowledge/denmark/prehistoric-period-until-1050-ad/the-bronze-age/the-family-from-borum-eshoej/>; <https://en.natmus.dk/historical-knowledge/denmark/prehistoric-period-until-1050-ad/the-early-iron-age/the-woman-from-huldremose/> (consulted 18-02-2024).

In contrast, the arid conditions that prevail along the Nile Valley—especially in the desertic fringes chosen by past populations to place their cemeteries—has led to the preservation of extremely large quantities of textiles from funerary contexts. While in Europe, *a fortiori* in regions with acid soils, the bodies are skeletonized and often incomplete, in Egypt, they tend to be very well preserved through natural mummification or complex embalming processes, with their wrappings often still in place. This prompted a very early scholarly interest in mummies, even a certain fascination, which led to the routine unwrapping of bodies (Riggs, 2014: 37–76). In this case, the textiles were deemed to be an obstacle to the observation of the human remains and the retrieval of amulets and jewellery, and therefore removed from the body without much care, and often discarded or kept as samples. This is particularly well expressed by the Egyptologist Herbert E. Winlock, when describing the unwrapping of the mummy of Wah, a very well-preserved mummy of an early Middle Kingdom administrator from the Theban region: “There was a coffin, and in it, under a pile of laundered bed linen, lay a mummy with wrappings still as fresh as the day it has been buried [...] for 15 years, the mummy of Wah has been on exhibition [...] when it was used in some experiments with an X-ray apparatus. The first photograph gave us a sudden surprise. From Wah’s neck, down over his chest [...] there was a whole series of objects [...] Naturally we wanted to put this jewelry on exhibition. [...] so it was decided to take careful notes and detailed photographs before it was unwrapped [...]” (Winlock, 1940: 253). From the voluminous appearance of the mummy, visible on the archive photographs of the Metropolitan Museum of New York, there remain today only some disparate artefacts (a mummy mask, a number of jewellery pieces), a very decayed and now exposed body, a few large linen fabrics, and a series of textile samples cut around written marks.<sup>11</sup>

From these early discoveries of archaeological textiles, the field of textile research has expanded considerably since the early 2000s, through series of books (e.g. *Ancient Textile Series*, Oxbow Books), numerous case studies, and overarching articles setting theoretical frameworks for the discipline (e.g. Sørensen, 1997; Andersson Strand et al., 2010; Harris, 2012, 2020; Harlow & Nosch, 2014). In the context of the Nile Valley, the pioneering studies of Gillian Vogelsang Eastwood (Vogelsang-Eastwood, 1993; Kemp & Vogelsang-Eastwood, 2001), Christa Mayer-Thurman (Mayer-Thurman & Williams, 1979), and Ingrid Bergman (Bergman, 1975) were complemented by many years of study at the site of Qasr Ibrim (e.g. Adams, 2010; Crowfoot, 2011; Wild & Wild, 2014). Systematic publication efforts by the Textiles from the Nile Valley research group (i.e. De Moor et al., 2023, for the latest volume to date) and the different teams working in the Eastern Desert (i.e. Bender-Jørgensen, 2018, for extended bibliography) have also contributed to a much better knowledge of Egyptian textile production in the 1st millennium CE. A new generation of textile researchers have contributed to diverse approaches, from technology (e.g. Spinazzi-Lucchesi, 2021), to clothing practices (Hallmann, 2023),

---

<sup>11</sup> Objects visible online through the function “collection search” of the Metropolitan Museum website (<https://www.metmuseum.org/art/collection/search?q=wah>) (consulted 24-03-2024).

from scientific analyses (Dickey, 2022; Wozniak et al., 2021; Wozniak & Belka, 2022) to funerary usage (Yvanez, 2023). While much of this work focused on establishing the basic principles and organization of the textile *chaîne opératoire*, this movement coincided with a renewed interest in the different uses of textiles, including in burial contexts. Landmark studies incorporating recent standards for textile analysis with a precise interpretation of the burial phenomenon set new levels of exigence (Harris & Douny, 2014; Riggs, 2014; Grömer & Grassberg, 2018). The textile-related gestures around the dead can now be placed at the core of our reflection on burial practices.

This question has been explored before by bio-archaeologists, experts in physical anthropology and taphonomy. In France, for example, it has been explored during two particularly relevant workshops organized by the Groupe d'Anthropologie et d'Archéologie Funéraire, one in 1996 (*Rencontre autour du linceul*, Bonnabel & Carré, 1996) and one in 2008 (*Rencontre autour des sépultures habillées*, Bizot & Signoli, 2009). Focusing on the wrapping of the body with a shroud and/or its dressing in clothing, the proceedings of the two workshops give clear methodological guidelines for the excavation and documentation of human remains so as to record every sign left by the now-disintegrated or decayed wrappings. The case studies detail skeletal inhumations, identifying and mapping the taphonomic processes related to organic wrappings, burial practices, and local conditions of preservation (e.g. Langlois & Gallien, 2009; Fossurier, 2009; Kliesch & Pluton-Kliesch, 2009), but the unicity of each case makes generalizations impossible. Another approach, more modeling in nature, offered a list of diagnostic elements visible on the skeleton resulting from the use of either a shroud or clothing (Buquet-Marcon et al., 2009). The position of the bones in the shoulders, arms, legs, and feet seem particularly relevant, especially in the case of constraints and parallel alignments of specific bones ('wall effect'). Still, the interest here is mainly in recognizing the taphonomic traces left by pliable body wrappings on the skeleton, and not really in the textiles and textile-related gestures.

These initiatives, while bringing many different authors and perspectives to the table, remained situated within their main discipline. In the field as well as in museums, it appears that many practitioners were not necessarily aware of the need to consider both wrappings and body together, and—talking with colleagues engaged on different types of fieldwork—textile wrappings continue to be considered “problematic” artefacts. They can be perceived as difficult objects to study, needing the intervention of specialists. In temperate milieu, the conditions of preservation can also mean that the best way to study the inhumation is to block-lift it for excavation in a laboratory with the help of conservators (Rast-Eicher, 2009). The quantity of additional information that can then be retrieved is appreciable (Enevold, 2013). However, when far from national scientific facilities and while working under severe time or budget constraints (for example in salvage situations or remote areas), such approaches cannot be routinely implemented. What to do when faced with tens and tens of well-preserved bodies, sometimes naturally mummified, which emerge from excavations in places such as Egypt and Sudan? Archaeologists must deal with issues of transport, lack of storage space, the absence of specialists on site, short

excavation seasons, limited budgets, and often no easy access to laboratory facilities. Funerary textiles can then quickly become a difficult problem that must first be solved logistically, before research can even be considered.

Faced with these issues and inspired by conversations with colleagues from different academic horizons, as well as by the new momentum of textile research in archaeology, we hope to initiate engagement in a two-way discussion between physical anthropologists and textile experts, fostering a better understanding of our methods, research interests, and challenges. The different talks presented during the workshop, which found their way into the present volume, highlight the many challenges posed by funerary textiles, both in the case of archival research and ongoing fieldwork settings, which could be answered in the future by the development of collaborative projects.

## 1.4 Examples of Current Fieldwork and Diversity of Approaches—Structure of the Book

The present volume and introduction therefore adopt a dual approach, considering studies based on archival material carried out in museums and ongoing studies in the field. These two aspects will be developed in the first part of the volume through the two theoretical and methodological chapters written by Karina Grömer (*Theoretical Approaches to the Functions of Textiles in Graves. Case Studies from 1000 BCE–1000 CE in Central Europe*) and Estella Weiss-Krejci (*Fabrics and Funerals: An Ethnographic Enquiry*), which each explore one of these two types of territories—archaeological excavation and archives. Case studies from diverse areas of Europe and the Nile Valley will then provide different examples, highlighting the diversity of contexts and unique challenges. The case studies are grouped according to the type of “textile presence” around the dead: textiles on bodies (Grupa; Lipkin; Kozieradzka-Ogunmakin; Mahler & Czaja), textiles separated from bodies (Margariti et al.; Grupa & Kozłowski; Wozniak), and textiles that have completely disappeared from the burial record (Siennicka; Gomes).

The experts who took part in this workshop developed their expertise in two distant geographical areas, Europe and the Nile Valley, where climatic and environmental conditions have a different impact on the preservation of organic remains. Except some church crypts, which constitute a rare location where textiles and other organic materials can be preserved in excellent condition, the temperate and humid European climate strongly affects textiles, which degrade rather quickly, and in the majority of cases only mineralized traces attest to their presence in the burial. At the other end of the spectrum, the arid environment of the Nile Valley reveals numerous intact textile assemblages, whose repetitive character poses real issues for their documentation, study, and storage. Despite these huge differences, both areas remain challenging places to work in. Depending whether the human remains must be studied *in situ* or are removed from their original place of inhumation, researchers work under diverse constraints and regulations that limit the invasive character

of their examinations. Last but not least, research on textiles still enveloping human remains poses ethical questions.

The paper *Silk Textiles in Funerary Liturgical Garments in Poland (17th–19th Centuries)* by Dawid Grupa, focuses on the reconstruction of liturgical garments in burials, based on data from systematic and well-documented fieldwork. At the same time, the author shows how, in the background, the difficulty of textile documentation in crypts affects research, describing situations where the human remains had to be removed due to imminent construction works planned in still-functioning parishes. In most cases, both in crypts and ossuaries, the bones are skeletonized and disturbed, the textile remains degraded due to poor environmental conditions, making the reconstruction of the original assemblage more challenging, but simultaneously facilitating their collection and post-excavation documentation. The question of storage, of both bones and textiles in separated dedicated containers, is also raised, questioning the application of conservation and/or ethical guidelines. In the case of the exceptional preservation of naturally mummified human remains in the Szczuczyn crypts, which prompted an inventorial programme to document the assemblages, archaeologists, textile experts, and physical anthropologists had to work within difficult spatial constraints and follow a non-invasive approach, limiting their intervention to descriptive and photographic documentation based on their visual examination of the burials.

The paper *Research on Post-Medieval Funerary Attire: Ethics, Challenges, and Successful Methods in Studying Coffin Textiles Found Below Finnish Church Floors*, by Sanna Lipkin, is an excellent example of combining both micro-sampling and non-invasive techniques, such as CT scanning, to retrieve as much information as possible about the deceased's body but also about the funerary setting (textiles, coffins) in which it is enclosed. At the same time, the limited physical space permitting access to the burials poses challenges for the proper documentation of the bodies deposited under church floors. Lipkin's discussion of the ethical considerations regarding the body and textiles—treated as the “second skin” of the deceased—strongly advocates for a more systematic integration of these questions into our discipline.

The paper by Robert Mahler and Barbara Czaja, *Textiles and Bones on Site: A First-Hand Experience from the Cemeteries at Naqlun (Egypt) and Crypts at Old Dongola (Sudan)*, offers an interesting counterpart to the above, by discussing the archaeological approach taken to complete funerary assemblages in the field in a non-European area. Similarly to the papers by Grupa and Lipkin, the authors share their experience of documenting Christian burials located in religious spaces (crypt chapel, monastic cemetery). Interestingly, these no longer have a connection to a functioning community, or at least, in the case of the Naqlun monastery, the present community seems to express a limited interest in the archaeological research conducted among the Christian archaeological remains and heritage. The situation appears closer to the emergency intervention described by Grupa, when archaeological research is seen as a necessary step prior to extensive building works. Archaeologists have to remove the coffins and their contents to the dighouse, which has limited storage space, but they also have to adapt their documentation and

analysis methods to meet the constraints imposed by Egyptian law, which forbids the export of any archaeological samples from Egypt. In the absence of portable devices such as X-ray machines, both physical anthropologists and textile experts apply more invasive methods to retrieve data. A constant dialogue and collaboration between the specialists throughout the different stages of the analysis prevents/limits the loss of crucial information about the funerary assemblages.

The successful collaboration described by Mahler and Czaja seems, unfortunately, to constitute an exception rather than reflect common practice in the archaeological research conducted in the Nile Valley. The difficulties for field archaeologists and physical anthropologists in dealing with overwhelming quantities of well-preserved textiles with no textile expert present are expressed by Iwona Kozieradzka-Ogunmakin in her paper *Grave Concerns: The Complexity of Recovery, Documentation, and the Study of Funerary Textiles from Ancient Egyptian Inhumations at Saqqara*. Her case study from Saqqara demonstrates the urgent need for a systematic integration of textile studies in Egyptology, independently of the sites and periods studied. The exceptional preservation of the textile remains, in significant quantities, calls for a tailored approach for documenting and analysing the funerary assemblages, while keeping in mind the limited possibilities for sampling and conducting archaeometric analyses in the Egyptian context.

The next section comprises papers about funerary textiles which, for various reasons, have been physically separated from their archaeological context (funerary urn, crypt burial), and which are documented and studied mostly post-excavation. The chapter by Magdalena Wozniak, *Wrapping Practices in Medieval Sudan. Case Studies from Gebel Adda*, discusses an assemblage of textiles found in church burials during the Nubian Salvage Campaign, during which the excavations were conducted within tight time and financial constraints, and the team comprised no textile expert. Both the archaeological material retrieved from the site and the field documentation have travelled extensively, and numerous archives have been split between specialists to carry out the data analysis. Despite years of study, unfortunately, the final publication was never completed. This paper demonstrates the necessity and benefits of reinvestigating even incomplete archives, the study of which, when combined with detailed documentation of the textiles, can help to reconstruct, step by step, the preparation of the body and its deposition in the grave, shedding light on the textiles' functions in the funerary *chaîne opératoire*.

An important addition to the discussion in this workshop is the role of textile conservators in preserving fragile textile evidence. Christina Margariti and her colleagues consider the complex question of *Conservation Approaches for Pyre-Burial Textiles Excavated in Greece*, where textiles are preserved at various degrees of mineralization. The range of intervention varies from non-invasive documentation with CT scanning and micro-sampling (Iero Odos case study) to physical conservation treatment of the fabrics (Eleusis textile). Such decisions can only be taken by trained conservators, based on a detailed assessment of the condition of the fabric. The accessibility of specialized equipment and expertise is pivotal for retrieving as much information as possible about the technical and decorative features of the



textiles, to better understand their type and function in the delicate context of cremation-based funerary rites.

The last chapter of this section, by Małgorzata Grupa and Tomasz Kozłowski, discusses another type of fragile preservation, namely carbonized textiles. The paper *The Stronghold Has Become a Grave—Preliminary Analysis of Fabrics from Early Medieval Trzcianka, Janów Commune, Poland* offers an interesting case study where the funerary character of the textiles was in fact identified during the conservation process after excavation. After consolidation and cleaning, the textiles were closely examined and a fragment of human bone was found in the folds of the burnt textiles, leading the archaeologists to closely re-examine the context from which the fabric was retrieved. The combination of the textiles' technical features, their relationship to the human bone, and the function of this assemblage in the burnt layer investigated at Trzcianka led to the conclusion that a person died accidentally in the building's collapse, caught in the fire. This case study illustrates once again how a detailed documentation of textile fragments, even in a very degraded and fragile condition, adds to the understanding of the presence and role of textiles in archaeological contexts.

The last part of our volume's case studies underlines the importance of meticulous documentation of funerary contexts by archaeologists in order to assess the presence of textiles in the burial long after their physical destruction. Małgorzata Siennicka highlights the importance of *Two Mycenaean Textile Imprints from Tomb XXI at Deiras, Argos (Greece)*, which attest to the use of a tabby textile probably as part of the furnishings in the burial of a young child. The use of textiles in a funerary context is mostly attested by (limited) iconographic sources. The two relatively small fragments of unfired clay discussed by the author were apparently somehow unintentionally preserved in the storeroom (no label, no inventory number). However, their context proved possible to reconstruct thanks to the careful observation and description of the burial by the excavators, who noticed the "thin layer of whitish clay with a thin rim on which imprints of a linen fabric were still visible" (Deshayes, 1966: 58).

The importance of detailed and professional recording by archaeologists and physical anthropologists is also advocated by Francisco Gomes discussing *Naked Graves? Thoughts on the Recording and Reconstruction of Funerary Attire in the Early Iron Age of Southwestern Iberia*. Working in an area where the preservation of organic material is almost absent, at best in a mineralized condition, Gomes demonstrates the successful use of secondary evidence, such as belt buckles and fibulae, to identify the presence of textiles in Early Iron Age burials. His overview shows how careful observation of the mapping of these elements on the body, in association with other data such as the sexing of the bodies and their position in the grave, allows him to distinguish male from female attributes, and also to potentially differentiate wrapping shrouds from garments worn on the body. However, the first prerequisite for such analyses is the systematic production of high quality documentation by field archaeologists, while the results of older excavations should not be completely neglected, as they often remain the only record available for research on larger datasets. Research on disappeared textiles remains a challenging topic, which the author invites us to consider as an opportunity to "develop new and innovative research lines".

## 1.5 Conclusion

The great variety of these papers, covering large spatial and temporal areas, illustrates the very different states of preservation and access to funerary textiles that researchers can be confronted with. Nevertheless, all of them unequivocally demonstrate the importance of precise documentation of the textiles *in situ* as the cornerstone for our study and understanding of the fabrics' functions in the burial. Based on shared experiences about past and present practices, we propose a ***Protocol for the Study and Analysis of Funerary Textiles in situ***, as an outcome of the fruitful dialogue we have had during the workshop. Elaborated by Elsa Yvanez with the help of textile conservator Valentina Turina, the protocol was submitted for feedback to the workshop participants and other invited scholars. This tool was designed as a collective endeavour to map strategic steps in the recording of funerary textiles on well-preserved skeletonized or naturally mummified bodies. Together, we strove to identify adaptable and efficient methods to facilitate collaborative work at various stages of the process. During the workshop and the making of this book, our many discussions also highlighted the diversity of terms and expressions used to refer to funerary textiles—often based on local traditions, spiritual or religious dimensions, and languages—with nuances and differences often becoming diluted by generic and ill-defined English wording. We therefore decided to complete the volume with a short ***Glossary of Terms*** relating to funerary textiles, which could be used (despite its preliminary form) to start a deeper reflection on the topic. We hope that both the Protocol and Glossary will be useful to the many archaeologists and textile researchers working in different regions, helping them to build the best possible study.

Workshops, conferences, and collaborative publications contribute every year to better communication between scholars, and the interest in textiles has truly spread to every archaeological sphere, as its growing presence in, for example, the Annual Meeting of the European Association for Archaeologists continues to show. We hope that the book provides useful tools and inspiration for future research in both textile and burial archaeology, and promotes interdisciplinary collaborations. We can, in any case, be confident that the study of funerary textiles will continue to grow to incorporate more and more *in situ* analysis and joint projects.

**Acknowledgments** The editors would like to express their particular thanks to the Polish Center of Mediterranean Archaeology (University of Warsaw) for hosting the workshop in a hybrid format during a time marked by Covid restrictions and travel difficulties. The generous support offered by EuroWeb (COST CA19131) also guaranteed the employment of a professional team for the filming and online streaming of the workshop on YouTube, and therefore opened our discussion to a much wider engaged audience. We also thank the board of EuroWeb for financing parts of the editorial costs of the present volume, including the English proofreading undertaken by Stephanie Aulsebrook. The final editing work was possible thanks to the generous help received from Rayan Alhaj (Fashioning Sudan project, ERC 101039416) and Severine Marchi (Section Française de la Direction des Antiquités du Soudan).

The editors also wish to thank Christi Lue, associate editor at Springer, for her invitation to publish the present work in the *Interdisciplinary Contributions to Archaeology* series, as well as the Springer publishing team led by Solomon George.

Many aspects of the workshop—reflected in the present volume—have resulted from collegial discussions and ongoing knowledge sharing between many different actors. Some are authors of the following chapters, some offered their experience, anecdotes, and skills in an ad hoc manner. Either way, the editors would like to express their deepest thanks to everyone who contributed to this exchange: we have learned much, and always in an open and generous spirit of academic respect. Our gratitude goes to every contributor and peer-reviewer.

## References

- Adams, N. K. (2010). Political affinities and economic fluctuations: The evidence from the textiles at Qasr Ibrim. In W. Godlewski & A. Lajtar (Eds.), *Between the Cataracts. Proceedings of the 11th International Conference for Nubian Studies*, Warsaw University. PAM supplement series 2 (pp. 291–297). Warsaw.
- Andersson Strand, E., Frei, K. M., Gleba, M., Mannering, U., Nosch, M. L., & Skals, I. (2010). Old textiles—New possibilities. *European Journal of Archaeology*, 13(2), 149–173. <https://doi.org/10.1177/1461957110365513>
- Bender-Jørgensen, L. (2018). Textiles from Mons Claudianus, ‘Abu Sha’ar and other Roman sites in the Eastern Desert. In J.-P. Brun, T. Faucher, B. Redon, & S. Sidebotham (Eds.), *The Eastern Desert of Egypt during the Greco-Roman period: Archaeological reports*. Collège de France. <https://doi.org/10.4000/books.cdf.5234>
- Bergerbrant, S. (2019). Revisiting the ‘Egtved girl’. In R. Berge & M. M. Henriksen (Eds.), *Arkeologi og kulturhistorie fra norsk kysten til Østersjøen. Festskrift til professor Birgitta Berglund* (pp. 19–39). Trondheim, Museumsforlaget.
- Bergman, I. (1975). *Late Nubian textiles, Scandinavian joint expedition 8*. Scandinavian University Books.
- Bizot, B., & Signoli, M. (Eds.). (2009). *Rencontres autour des sépultures habillées. Actes des journées d'étude organisées par le Groupement d'Anthropologie et d'Archéologie funéraire et le Service Régional de l'Archéologie de Provence Alpes-Côtes d'Azur (Carry-le-Rouet, 13–14 Décembre 2008)*. Gap.
- Bonnabel, L., & Carré, F. (Eds.). (1996). *Rencontre autour du linéol. Compte-rendu de la journée d'étude organisée par le G.A.A.F.I.F et le service régional de l'archéologie de la Haute Normandie (Paris, le 5 avril 1996)*. G.A.A.F.I.F. Bulletin de liaison numéro spécial. Reims.
- Buquet-Marcon, C., Pecqueur, L., & Detante, L. (2009). Paires d'habits invisibles. In B. Bizot & M. Signoli (Eds.), *Rencontres autour des sépultures habillées. Actes des journées d'étude organisées par le Groupement d'Anthropologie et d'Archéologie funéraire et le Service Régional de l'Archéologie de Provence Alpes-Côtes d'Azur (Carry-le-Rouet, 13–14 Décembre 2008)* (pp. 65–75). Gap.
- Crowfoot, E. (2011). *Qasr Ibrim: The textiles from the cathedral cemetery*. Egypt Exploration Society.
- Crubézy, E. (2019). *Aux origines des rites funéraires. Voir, cacher, sacraliser*. Odile Jacob.
- De Moor, A., Flück, C., & Linscheid, P. (2023). Dress—Continuity and change in Egypt in the 1st millennium AD. In *Proceedings of the Twelfth Conference of the Research Group “textiles from the Nile Valley”*. Veurne.
- Deshayes, J. (1966). *Argos, les fouilles de la Deiras. Etudes Péloponnésiques IV*. Librairie Philosophique J. Vrin.
- Dickey, A. (2022). EDS analysis of Neolithic to Early Dynastic Egyptian woven cloth in the Bolton Museum collection. In A. Dickey, M. Gleba, S. Hitchens, & G. Longhitano (Eds.), *Exploring ancient textiles: Pushing the boundaries of established methodologies. Ancient textiles series 40* (pp. 93–110). Oxbow Books.

- Enevold, R. (2013). Pollen studies of textile material from an Iron Age grave at Hammerum, Denmark. *Journal of Archaeological Science*, 40, 1838–1844. <https://doi.org/10.1016/j.jas.2012.10.037>
- Fossurier, C. (2009). Le site de Chanteloup-en-Brie (Ile de France). Étude de cas et difficultés d'analyse taphonomique. In B. Bizot & M. Signoli (Eds.), *Rencontres autour des sépultures habillées. Actes des journées d'étude organisées par le Groupement d'Anthropologie et d'Archéologie funéraire et le Service Régional de l'Archéologie de Provence Alpes-Côtes d'Azur (Carry-le-Rouet, 13–14 Décembre 2008)* (pp. 21–27). Gap.
- Francigny, V. (2016). *Les Coutumes Funéraires Dans Le Royaume De Méroé: Les Enterrements Privés*. Éditions de Boccard.
- Frei, K., Mannering, U., Kristiansen, K., Allentoft, M., Wilson, A., Skals, I., Tridico, S., Nosch, M., Willerslev, E., Clarke, L., & Frei, R. (2015). Tracing the dynamic life story of a Bronze Age female. *Scientific Reports*, 5, 10431. <https://doi.org/10.1038/srep10431>
- Frei, K., Mannering, U., Vanden Berghe, I., & Kristiansen, K. (2017). Bronze Age wool: Provenance and dye investigations of Danish textiles. *Antiquity*, 91, 640–654. <https://doi.org/10.15184/aqy.2017.64>
- Gleba, M., & Mannering, U. (2010). A thread to the past: The Huldremose woman revisited. *Archaeological Textiles Newsletter*, 50, 32–37.
- Grömer, K., & Grassberg, M. (2018). Organic remains from archaeological contexts. Forensic taphonomy applied to prehistoric and early medieval inhumation graves. In *Proceedings 8th International Meeting on Taphonomy and Fossilization, 14th–17th September 2017*. Vienna, Austria. *Neues Jahrbuch für Geologie und Paläontologie*, Abh. 289/2, Stuttgart: 203–216.
- Hald, M. (1980). *Ancient Danish textiles from bogs and burials: A comparative study of costume and Iron Age textiles*. National Museum of Denmark.
- Hallmann, A. (2023). *Ancient Egyptian clothing: Studies in late period private representations* (Vol. 2). Brill.
- Harlow, M., & Nosch, M. L. (2014). Weaving the threads: Methodologies in textile and dress research for the Greek and Roman world—State of the art and the case for cross-disciplinarity. In M. Harlow & M. L. Nosch (Eds.), *Greek and Roman textiles and dress, ancient textile series 19* (pp. 1–15). Oxbow books.
- Harris, S. (2012). From the parochial to the universal: Comparing cloth cultures in the Bronze Age. *European Journal of Archaeology*, 15, 61–97. <https://doi.org/10.1179/1461957112Y.0000000006>
- Harris, S. (2014). Wrapping and unwrapping the dead: The Bronze Age mound burials of Southern Scandinavia through a wrapping analysis. In S. Harris & L. Douny (Eds.), *Wrapping and unwrapping material cultures. Archaeological and anthropological perspectives. UCL Institute of Archaeology publication 64* (pp. 115–134). Left Coast Press.
- Harris, S. (2020). The sensory archaeology of textiles. In *The Routledge handbook of sensory archaeology* (1st ed., pp. 210–232). Routledge. <https://doi.org/10.4324/9781315560175-13>
- Harris, S., & Douny, L. (Eds.). (2014). *Wrapping and unwrapping material culture: Archaeological and anthropological perspectives*. Left Coast Press.
- Hellström, P., Langballe, H., & Säve-Söderberg, T. (Eds.). (1970). *The rock drawings, the Scandinavian joint expedition to Sudanese Nubia publications* (Vol. 1). Scandinavian University Books.
- Kemp, B. J., & Vogelsang-Eastwood, E. (2001). *The ancient textile industry at Amarna*. Egypt Exploration Society.
- Kliesch, F., & Pluton-Kliesch, S. (2009). Les sépultures antiques du “Clos au Duc”, tissus, chaussures et taphonomie. In B. Bizot & M. Signoli (Eds.), *Rencontres autour des sépultures habillées. Actes des journées d'étude organisées par le Groupement d'Anthropologie et d'Archéologie funéraire et le Service Régional de l'Archéologie de Provence Alpes-Côtes d'Azur (Carry-le-Rouet, 13–14 Décembre 2008)* (pp. 36–46). Gap.
- Langlois, J. Y., & Gallien, V. (2009). Le souple dans tous ses états: de l'espace colmaté à l'espace vide. In B. Bizot & M. Signoli (Eds.), *Rencontres autour des sépultures habillées. Actes des*

- journées d'étude organisées par le Groupement d'Anthropologie et d'Archéologie funéraire et le Service Régional de l'Archéologie de Provence Alpes-Côtes d'Azur (Carry-le-Rouet, 13–14 Décembre 2008)* (pp. 13–20). Gap.
- Mannering, U., Gleba, M., & Hansen, M. (2012). Denmark. In M. Gleba & U. Mannering (Eds.), *Textiles and textile production in Europe: From prehistory to AD 400, ancient textile series series 11* (pp. 91–118). Oxbow books.
- Mayer-Thurman, C. C., & Williams, B. (1979). *Ancient textiles from Nubia: Meroitic, X-Group and Christian Fabrics from Ballana and Qustul*. Art Institute of Chicago.
- Nielsen, O. N. (1970). *Human remains metrical and non-metrical anatomical variations*. Scandinavian Joint Expedition 9. Lärmedelsförlagen Svenska bokförlaget.
- Rast-Eicher, A. (2009). La fouille de textiles et cuirs. In B. Bizot & M. Signoli (Eds.), *Rencontres autour des sépultures habillées. Actes des journées d'étude organisées par le Groupement d'Anthropologie et d'Archéologie funéraire et le Service Régional de l'Archéologie de Provence Alpes-Côtes d'Azur (Carry-le-Rouet, 13–14 Décembre 2008)* (pp. 97–102). Gap.
- Riggs, C. (2014). *Unwrapping ancient Egypt*. Bloomsbury.
- Säve-Soderberg, T. (Ed.). (1981). *Late Nubian cemeteries, the Scandinavian joint expedition to Sudanese Nubia Publications* (Vol. 6). Scandinavian University Books.
- Sørensen, M. L. S. (1997). Reading dress: The construction of social categories and identities in Bronze Age Europe. *Journal of European Archaeology*, 5(1), 93–114.
- Spinazzi-Lucchesi, C. (2021). Textile Tools from Ancient Egypt: The case of Gurob. In *Purpleae Vestes VII Redefining Textile Handcraft. Structures* (pp. 463–470).
- Szymaszek, M. (2015). On the interpretation of textile finds with right-angled or H-shaped tapestry bands. In A. De Moor, C. Flück, & P. Linscheid (Eds.), *Textiles, tools and techniques of the 1st millennium A.D. from Egypt and neighboring countries* (pp. 168–175). Lannoo.
- Vanden Berghe, I., Gleba, M., & Mannering, U. (2009). Towards the identification of dyestuffs in Early Iron Age Scandinavian peat bog textiles. *Journal of Archaeological Science*, 36(9), 1910–1921.
- Vogelsang-Eastwood, G. (1993). *Pharaonic Egyptian clothing*. Brill.
- Wild, J. P., & Wild, F. C. (2014). Qasr Ibrim: New perspectives on the changing textile cultures of lower Nubia. In E. R. O'Connell (Ed.), *Egypt in the first millennium AD. Perspectives from new field work, British Museum Publications on Egypt and Sudan 2* (pp. 71–80).
- Winlock, H. E. (1940). The mummy of Wah unwrapped. *Metropolitan Museum of Art Bulletin*, 35(12), 253–259.
- Wozniak, M. M., & Belka, Z. (2022). The provenance of ancient cotton and wool textiles from Nubia: Insights from textile technical analysis and Sr isotopes. *Journal of African Archaeology*, 20(2), 202–216. <https://doi.org/10.1163/21915784-bja10019>
- Wozniak, M. M., Witkowski, B., Ganeczko, M., Gierczak, T., & Biesaga, M. (2021). Textile dyeing in medieval Sudan evidenced by HPLC-MS analyses: Material traces of a disappeared activity. *Journal of Archaeological Science: Reports*, 38, 103098. <https://doi.org/10.1016/j.jasrep.2021.103098>
- Yvanez, E. (2018). Se vêtir à Gebel Adda. Nouvelles perspectives de recherche sur l'identité culturelle en Nubie méroïtique. In M. Maillot & G. Choimet (Eds.), *Actualités archéologiques françaises au Soudan, Routes de l'Orient, h.s 3* (pp. 103–123).
- Yvanez, E. (2023). Textiles in the funerary chaîne opératoire. Perspectives from Meroitic and Postmeroitic Sudan and Nubia (c.350 BCE–550 CE). *Journal of African Archaeology*, 21(2), 154–179. <https://doi.org/10.1163/21915784-bja10030>
- Yvanez, E., Witkowski, B., Gierczak, T., & Biesaga, M. (2025). Blue threads along the middle Nile. Multidisciplinary approaches to an ancient passion for indigo (Sudan, c. 1st–6th century CE). In C. Brøns & E. Yvanez (Eds.), *The colour blue in ancient Egypt and Sudan. Nubia. Studies in the archaeology and history of Northeast Africa*. Brepols.

**Elsa Yvanez** is an archaeologist specialised in the textile production of ancient Sudan and Nubia, in the chaîne opératoire and economic significance of spinning and weaving, as well as in the use of textiles for clothing and burial. After a Marie-Sklódowska Curie fellowship (TexMeroe, MSCA 743420), she conducted the Unravelling Nubian Funerary Practices project at the Polish Centre of Mediterranean Archaeology, University of Warsaw. She is currently employed as an associate professor at the Centre for Textile Research/Saxo institute, at the University of Copenhagen, where she is leading the 5-year research project Fashioning Sudan. Archaeology of dress practices along the Middle Nile (ERC StG 101039416). In parallel, she is also acting as a textile specialist for several excavation teams working in Egypt. She is member of EuroWeb's working group 1 (Textile technologies) and 2 (Clothing Identities).

**Magdalena M. Wozniak** is an archaeologist, currently an assistant professor at the University of Warsaw and a Postdoctoral Researcher at the University of Copenhagen. Her research focuses on the textile production and dress practices in the Nile Valley (Egypt and Sudan). She is a member of the *EuroWeb* COST Action.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



**Part I**  
**Aspects of Theory and Methods**

## Chapter 2

# Theoretical Approaches to the Functions of Textiles in Graves



### Case Studies from 1000 BCE–1000 CE in Central Europe

Karina Grömer

**Abstract** The interpretation of textiles from prehistoric graves is sometimes complex, as there are different reasons as to why textiles can be found within the archaeological context of graves. Textiles can have a ritual/sacred meaning in graves, referring to the rites of passage between the time of death and the time of burial, or they can have a meaning during the burial itself.

Inhumation graves can provide essential information about the clothing of the deceased, although whether this represents a special dress for the dead or clothing that was also worn by the living must be discussed. Here, too, the rites of passage must be observed, since even according to historical and ethnographic references, a person is not usually buried in the clothing in which he/she died. Various rites of undressing, cleansing, re-clothing, adornment, or veiling are performed before actually burying the dead body. All these rites give back to the corpse its social identity. Fabrics were also used as grave goods, with a value comparable to bronze vessels or precious weapons.

In different time periods, rites of wrapping the grave goods and/or the corpse or the cremated remains are common. Weapons in particular (especially the bare blades of swords, but also entire swords or scabbards) are often deliberately wrapped with textiles before they are placed into the graves. The occurrence of textiles as wrappings or shrouds is always connected with the religious ideas and world views that support these rites. For prehistoric times, these cannot be fully deciphered due to the lack of written sources.

In addition to ritual meanings, there are also purely functional reasons for the occurrence of textiles in graves: a textile that is a functional part of another artefact (e.g. the textile lining of a sword scabbard or sheet metal belt) was not deliberately

---

K. Grömer (✉)  
Natural History Museum Vienna, Vienna, Austria  
e-mail: [karina.groemer@nhm-wien.ac.at](mailto:karina.groemer@nhm-wien.ac.at)



deposited in the grave as a meaningful textile *per se*. Textiles can also be used to furnish the burial chamber, as covers of mattresses or pillows.

**Keywords** Funerals · Ritual sphere · Functional sphere · Europe · Prehistory · Roman period · Early middle ages

## 2.1 Introduction

An important research objective for textile studies is the establishment of a systematic overview of the functional aspects of textiles in specific past societies. The identification and understanding of the different functions of textiles sheds light on the particular meaning of textile production within a society, as well as on the handling of resources. A detailed scheme about primary and secondary use of textiles in prehistory has been developed within the last few years (Grömer, 2016, Fig. 171), based on archaeological evidence. The aim of this paper is to develop a better understanding of the functions of textiles that are excavated from graves. The focus is on prehistoric Europe, with some examples from the Roman period and the Early Middle Ages.

In Central Europe, textiles dated to between 1000 BCE and 1000 CE can usually be found in graves only as mineralized fragments, attached to metal artefacts such as jewellery, swords, knives, or bronze vessels. Textiles preserved by metal corrosion products in graves are usually very small, and the colour information is mostly lost. The condition of the textiles ranges from organic preservation with a clearly recognizable fibre structure, to fabrics where only an imprint is visible in the corrosion of the metal object. However, valuable information can still be obtained (Mitschke, 2001, 32–46).

Their find context is important, as it is necessary to reconstruct a detailed history of the deposit to understand the functions of textiles in graves. In recent years, large block lifting of complete graves (e.g. Banck-Burgess, 2012; Štolcová & Zink, 2013) have allowed a more detailed contextual analysis, as complete graves are excavated in the lab with detailed microstratigraphy. These allow astonishing new insights into the burial rites and the importance of organic materials, such as textiles, leather, wood, fur, etc. during each stage. They serve as benchmark studies for our knowledge of material culture in prehistory and early history. Block lifting and its associated detailed studies are unfortunately still not the rule during the retrieval of archaeological textiles from graves in the region and time span in focus. Usually, textile experts working within this specialization deal with single artefacts with attached textile remains. This, of course, is challenging for the contextualization and interpretation of the artefacts, as sometimes only fragmentary information is available for further study.

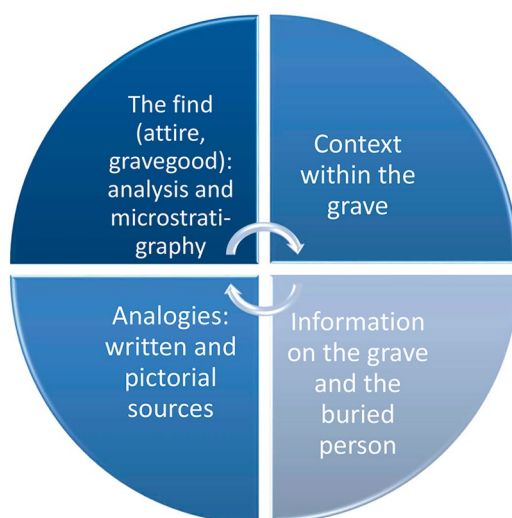
## 2.2 Method of Analysis and Interpretation

A model for the analysis of individual artefacts with attached textiles is presented here briefly (Fig. 2.1). The scheme shows the interpretive steps that have to be taken into account. In most cases, a committed interdisciplinary approach is vital for an accurate interpretation.

Usually, it is first necessary to deal with the single find: a piece of jewellery (bracelet), dress fitting (fibula, belt buckle), or other grave good (knife, bronze vessel), and its attached textile. The analysis of the textile involves technical description, fibre analysis, and the microstratigraphy of textile layers attached to the metal object. Textile research today makes use of numerous examination methods, such as scanning electron microscopy, microstratigraphy, wool fineness measurements, 3D-CT, etc. These modern scientific methods enable deeper insight than was possible a few decades ago—when fibre analysis on mineralized objects could not even be carried out. The most important data that can be collected from mineralized textiles are, for example, the weave type, fabric density, thread thickness, thread twist, etc. (see Grömer, 2014, 9–16; Walton & Eastwood, 1988).

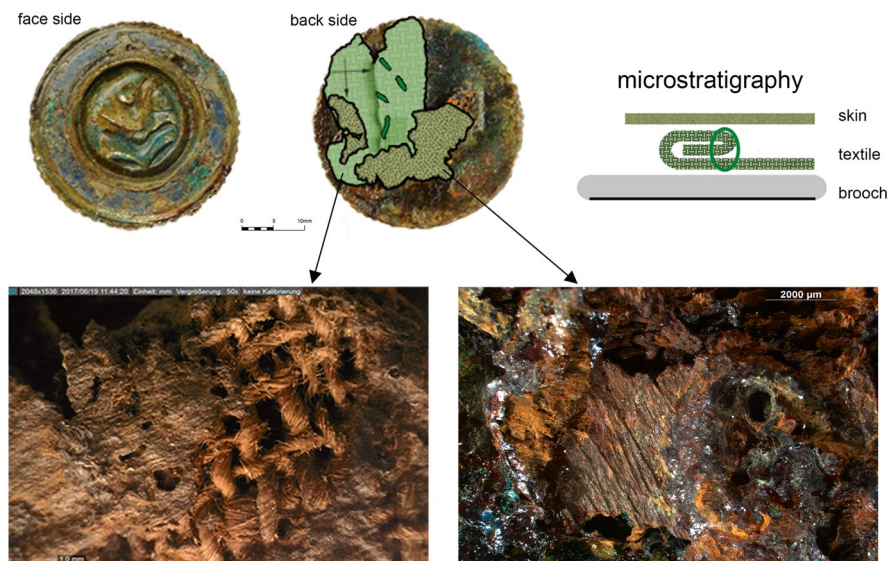
To go further in our interpretation, the analysis of the microstratigraphy is vital. Microstratigraphy describes the stratification of various organic materials (Hägg, 1989, 431–435) preserved on metal objects. Since they corroded onto each other, the layering of the textiles at the time of the burial is reproduced. Thus, the stratigraphic position of textile remain(s) holds important potential for interpreting their function. For the visualization and documentation of the organic layers and their microstratigraphy, a standardized mapping system was developed by the Landesamt für Denkmalpflege in Bayern (Nowak-Böck & Voß, 2015; see also <http://www.blfd.bayern.de/medien/kartierungssystemorganik-erlaeuterung.pdf> (17.3.2021)).

**Fig. 2.1** Analysis of textiles attached to single artefacts from graves.  
(Image: Grömer K, NHM Vienna)



To understand how to visualize such organic layers, a straightforward example is provided by an early Medieval brooch; the brooch, dated to around 900 CE, was found in the cemetery St. Martin im Lungau, Austria (Grömer & Grassberger, 2018). The artefact displays an interesting microstratigraphy, with textile layers and human skin (Fig. 2.2). Directly on the back of the brooch, between it and the layer of human skin, a linen tabby textile of medium quality was found. The details of a seam identified on this textile is among the rare cases known from mineralized textiles.

When working with single artefacts, the context of the object within the grave is of importance for a conclusive interpretation regarding its function. Whenever possible, the exact position of the artefact, in relation to the body of the buried person, should be documented. A fibula or belt buckle may serve as an example; it is essential to determine whether or not it was placed on the body of the buried person in a functional position where it formerly gathered a garment. A belt buckle that was placed next to the legs should be regarded as a pure burial gift, and not as a dress accessory that held a garment (e.g. Linz, Roman period, Grömer, 2014, 142, Fig. 83). Adhering textile remains are then not automatically identified as clothing, as they could also represent wrappings for this item. Even if the artefact was placed in situ, e.g. a fibula on the shoulder, it is also important to note the position of the textile in relation to the body of the buried person. A textile found on the back of the fibula (i.e. between the brooch and body) might be interpreted as the garment held by the brooch, whereas a textile on the face side of the fibula could also have belonged to a shroud that was placed over the dressed person.



**Fig. 2.2** Example: Early Medieval brooch from St. Martin im Lungau, with textile and human skin. (Image: Grömer K, Rudelics A)

All these observations have to be integrated with the information about the grave and the buried person. How rich is the grave (in comparison to contemporary ones of the same region)? Is it a warrior's grave or the burial of an artisan? The sex and age of the buried person are also essential for interpretation, as, for example a textile attached to a belt buckle in an early Medieval woman's grave might have belonged to a dress, while a similar textile on the back of a belt buckle in a contemporary man's grave could be interpreted as fragments of trousers or a tunic. Information on the sex and age of the deceased can be a significant asset for further studies. The focus here is not on the complex problem of interpreting gender (rather than anthropologically determined sex) in graves, which would be a task for further studies (see e.g. Sørensen, 1991). Comparisons with pictorial and written sources, as well as with complete garments and other finds, are also necessary for the identification of the function of a textile.

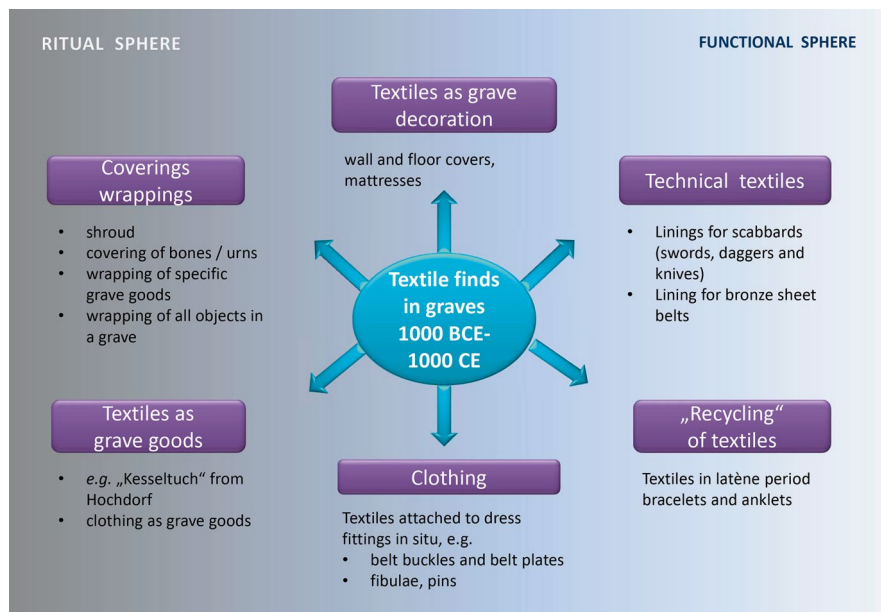
### 2.3 Theoretical Approach—Functions of Textiles in Graves

Textiles clearly played a central role in the rituals of a burial (Vedeler et al., 2018; Martin, 2014), however they may have been used, as one of the expressions of the complex interactions of people that took place between the moment a person died, until the corpse was finally covered with soil or deposited in the burial chamber. All these expressions are material traces of belief systems, of religion, of world views, as well as the desire for status and representation, social hierarchies, and many other tangible and intangible elements of past societies (Rebay-Salisbury, 2012; Sørensen, 1997). What is actually found is only evidence of what entered the grave itself.

The theoretical approach presented here lays out six categories of textile-related behaviours, explaining the modalities of the presence of textiles in the grave, upon which interpretations can be built. Those categories or aspects belong to two main spheres—the ritual and functional spheres (Fig. 2.3). These two spheres should not be considered to represent a strict division, but rather two ends of the same continuum, as there is a smooth transition between the two.

The ritual sphere comprises textiles that had symbolism and meaning in the ritual, e.g., textiles that served as grave goods, as coverings, or as wrappings. The use of textiles as garments worn by the deceased or as soft furnishings for the decoration of the grave might both be placed in the ritual sphere, but they also point to a more functional aspect of textiles within the funeral ceremony.

In addition, there is a purely functional sphere, in which textiles were not placed into a grave because of ritual aspects. In those cases, the textiles might not even be recognized by the people handling them, as they were an integral part of other artefacts, or their presence could even represent an act of textile recycling.

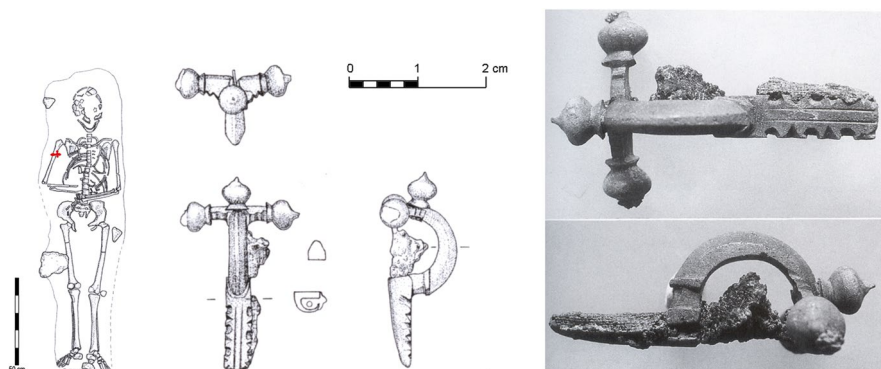


**Fig. 2.3** Functions of textiles in grave contexts as determined from archaeological evidence from Central Europe, 1st millennium BCE and 1st millennium CE. (Image: Grömer K, NHM Vienna)

### 2.3.1 Clothing

Garments, the clothing the buried person was dressed in, are important for our understanding of burial rites in Central Europe between the 1st millennium BCE and the 1st millennium CE, but also of dress practices during life. Especially in prehistoric archaeology, the analysis of dress attire (such as brooches, pins, and belts), as well as jewellery, is important for studies of social hierarchies and the visual codes of those societies (Martin, 2014; Rebay-Salisbury, 2012; Sørensen, 1997; Vedeler et al., 2018). Placement patterns, the evidence of how dress fittings, such as fibulae, pins, and belts, have been placed on the dead body, are used to reconstruct prehistoric costume. A significant pitfall in this approach is that the evidence can be interpreted in different ways. For example, an Iron Age woman's grave containing two fibulae placed on the shoulders and a belt may have been used to gather/hold various dress elements, such as a blouse, skirt and cloak, dress and mantle, or a 'peplos' (for possible variations, see Grömer, 2016, Fig. 237). All of those would create different costume ensembles and body silhouettes. Nevertheless, if textile remains were found attached to the belt buckle or fibula, information would be revealed about the raw material, quality, weave type, and, in well-preserved cases, about the pattern (e.g. spin pattern) used.

The late-Roman-period graves (fourth and fifth century CE) from Mautern and Frauenberg near Leibnitz, both in Austria, might serve as examples (Fig. 2.4). In a



**Fig. 2.4** Frauenberg: brooch with textile layers; the artefact was found in the grave on the right shoulder of the deceased. (After Grömer, 2014)

male's grave (grave 23) from Mautern-Melkerstrasse (Grömer, 2014, 141 and Taf. 29), a belt buckle was situated on the abdomen. Next to the body, a dense rep weave was found, and between the rep and the belt fine linen tabby was identified, which was also found in three layers on the front side of the belt buckle. In this case, the following might be hypothesized: the textiles directly on the clasp facing the body belonged to the garment which was belted—in a Roman setting this might have been a tunic. The cloth worn under the belted tunic (from the Mautern belt) could have been trousers or an under-tunic.

From Frauenberg near Leibnitz (Grollegger, 2002; Steinklauber, 2002), there are several graves of men, women, and children with fibulae on the right shoulder. In some cases, textiles survived on the pins or inner sides of the fibulae, where they gathered the textile. Such textiles, located at the right shoulder, may have belonged to any type of mantle or to a cloak. Only a small part has been preserved, where such a mantle would have been fixed with the fibula. As known from written sources, there were different names for the mantles of men and women, and in a Roman context, such garments might be termed a *pallium* or a *palla* (see Cleland et al., 2007 for definitions and other possible terms).

The well-known ivory diptych of Stilicho (Croom, 2002, Figs. 35 and 39), dated to c. 400 CE, can serve as a comparable contemporary pictorial source for the archaeological evidence from the graves. The depiction shows a man with a cloak held by a fibula and a belted tunic, under which he is wearing leg covers, which might be trousers. However, such images are just an aid for understanding the former use of the textiles in the graves, since with just very tiny fragments, there is no possibility to reconstruct the former shapes and silhouettes of the whole ensemble. As discussed above, the advantage is that some information does become available regarding what kind of fabric qualities and raw materials were used for belted garments or garments held by brooches—in this case from Roman times. This is not the place to discuss the possibilities and pitfalls of costume reconstruction, which is a topic covered by various publications (e.g. Rast-Eicher, 2008, 177–178 especially).



It is very difficult to draw a sharp line between ritual and functional dress (see also Vedeler et al., 2018). In one context a garment could be functional, in another context, ritual. As a social code, the dress or costume acquires meaning through normative behaviour; in other words, as a result of continuous and repeated use in the same context. For most prehistoric societies, it is difficult to know if the separation between a functional sphere and a ritual sphere even existed, even though it does in our own modern society, which we constantly confirm through normative behaviour (Pader, 1980). Thus, the following is of great importance here: if clothing can be identified, the question still remains as to whether it was a garment that was used during life as well (in daily life or as festive costume), or if the costume worn by the dead was specifically made for the funeral (funeral dress) (see Sect. 3.1).

### 2.3.2 *Textiles as Grave Decoration*

Textiles also served as soft furnishings that had the function of serving as a decorative element for the grave. The princely grave of Eberdingen-Hochdorf (Banck-Burgess, 1999, 75, 194; 2012), dated to c. 550 BCE, is a famous example from the Central European Iron Age. The whole grave of a c. 40-year-old man was impressively equipped with various textiles, among them soft furnishings. The burial chamber was completely lined with textiles. Fabrics were spread out on the floor as coverings; in one spot, there was also an animal skin. The walls of the wooden grave chamber were decorated with various wall hangings, over which drinking horns were hung. Precious tablet-woven bands with complicated patterns adorned the wall hangings made in twill fabric, which were fastened onto the wall with iron hooks. Bronze fibulae were also used to decorate and drape the wall hangings. Additionally, mattresses and pillows were identified. In this case, the fabrics of the wall hangings and floor coverings were used to decorate the burial chamber. Thus, they were visual markers of the presentational idea behind the overall staging of this grave. To be able to interpret textile fragments that are indicative of such practices, there is a need for excellent preservation conditions and meticulous excavation methods, such as those facilitated by the block lifting of entire Iron Age graves.

Textile soft furnishings can also be detected in very subtle forms, such as textile imprints in the mortar on the walls of Roman-period sarcophagus graves at Wels (Ovilava) and Hollenburg in Austria (Grömer, 2014, 155–156). Those imprints indicate that textiles were used to cover the walls of these Roman graves, and had been installed in the grave when the mortar was still wet.

### 2.3.3 *Ritual Sphere—Coverings and Wrappings*

For the ritual sphere, all kinds of coverings and wrappings are of importance. In a comprehensive study, Margarita Gleba (2014) offers a classificatory system for the practice of textile wrapping:

- (a) Wrapping or covering of the body with a funerary shroud;
- (b) Wrapping of the cremated remains placed in an urn;
- (c) Wrapping of an urn containing cremated remains;
- (d) Wrapping of both the cremated remains placed inside an urn and an urn itself;
- (e) Wrapping of specific burial goods;
- (f) Wrapping of all objects in the burial.

Her classification, mainly based on her research in Italy, offers a useful system that should be used routinely in textile research. Here, in addition to examples offered by Gleba, I provide more archaeological evidence from Central Europe and further ideas.

**(a) Wrapping or covering of the body with a funerary shroud** Among the shrouds and other forms of direct covering of the body, an interesting piece of evidence comes from Osteria dell'Osa, grave 3 (ninth century BCE; Gleba, 2014, Fig. 7.1). In this case, the only remaining traces of the shroud are the bronze rings that were found around the buried person in a rectangular arrangement, indicating the metal edge trimmings of a textile. It might have been a rectangular shroud that was spread over the buried person.

Furthermore, textiles attached to the front face of jewellery and costume components in graves (e.g. Frauenberg grave F353, fabric Rö-171 on the outside of a fibula: Grömer, 2014, 274, Taf. 44) could also have belonged to a shroud that covered the fully dressed corpse (see discussion in Urbanová, 2010, 36–37). When excavating Roman-period burials, it is not unusual to find the dead had been buried in very compressed positions (“wall effect”), meaning that in extended burials in soil, the bones, especially the arms and legs when stretched along the body, have been found unnaturally close to the body. If there is no indication of a wooden coffin, this might be a sign that the body was originally wrapped very tightly by a shroud.

Shrouds from the Roman Empire and Late Antiquity are best known among the large textile finds from Egypt, for example from Arsinoe (Von Falck, 1996, 374). Ancient written sources provide some Greek words for ‘shroud’ (Liddel & Scott, 2007): *to pharos* (any large piece of fabric, cloth, canvas, blanket, cover; shroud), *he lis* (a smooth, simple fabric, without embroidery or interwoven decoration, simple white shroud with which the deceased is covered on a parade bed), or *to speiron* (a garment or cloth to wrap or cover, a cover to cover the body; shroud).

A rare and highly specific way of covering a corpse in the context of Central Europe during 1000 BCE–1000 CE is to wrap it as a mummy, embalming or otherwise preparing and then wrapping the body in textiles in an attempt to preserve the flesh and/or the original shape of the body. Rare cases are ever known in temperate



Europe from the Roman period. A unique find for Austria is the mummy from Carnuntum (Fig. 2.5), dated to the middle/end of the third century CE (Grömer, 2014, 156–159), when the area south of the Danube belonged to the Roman Empire (provinces Noricum and Pannonia). A young girl was carefully wrapped into at least four different textiles, all tabbies of different qualities, with one of the bandages measuring 9 cm in width. The method of wrapping is clearly visible; it was horizontally around the body, not crosswise as usually found in contemporary Egypt, even taking into account that the wrapping pattern varies between different sites and by individual social status, as well as the period. The arms were wrapped separately. Contemporary mummies from Egypt usually placed the arms in direct contact with the body; this specific wrapping method more likely points to influence from Syria (Paetz gen. Schieck, 2012). This find has cultural-historical implications, since together with other mummy finds in the Roman province of Pannonia (Póczy, 1999, Aquincum, Brigetio, Intercisia in Hungary) it indicates that in the third century CE some social groups felt connected to oriental cults. This is also attested through other aspects of material culture, such as small figurines of Isis and Osiris. During

**Fig. 2.5** Mummy of Carnuntum. (Image: Grömer K, NHM Vienna, Project DressID)



this time, the Roman military stationed Syrian units along the Danube Limes, so the physical presence of Syrians must be expected (Paetz gen. Schieck, 2012).

**(b) to (d) Wrapping of cremated remains and/or urns** In the 1st millennium BCE until c. 300 CE in Central Europe, cremation burials were also a common practice. Textile remains have been found directly in the urn or stone box next to the human remains (cf. also Fath, 2012, 79; Grömer, 2014, e.g. cat. HaZ31–34 Bischofshofen-Pestfriedhof in Austria). Thus, they can be interpreted as wrappings or even bags in which cremated bones were kept before placing them into the urns.

This expresses a very careful handling of human remains. In Iron Age Italy, linen in particular was used to wrap cremated bones during the burial ritual. This practice is also described by Homer for the burials of Hector and Patroclus (*Iliad* 34.796 and 23.254), and is assumed to have been adopted by elites throughout the Mediterranean during the Iron Age, when it is attested, for example, in Vetulonia and Veio in Italy (Gleba, 2014, 136–141).

So far, it has usually been assumed that textiles used to dress or cover the deceased on the pyre cannot ‘survive’ the burning process, and thus could not have been deposited into the grave to be found later by archaeologists. Therefore, textile remains found in cremation graves are usually interpreted as subsequent wrapping, especially if they are associated with burnt and deformed metal objects. To shed new light on such research questions, large-scale cremation experiments have been carried out in an interdisciplinary cooperation between anthropologists, forensic scientists, and archaeologists, and conducted with five repetitions of the same setting from 2018 to 2022 at the open-air museum Asparn an der Zaya, Austria. A Late Bronze Age grave from Inzersdorf in Austria served as a model, with a pig substituting for a human body—fully dressed, with a linen garment, woollen cloak, belted, and covered with a linen shroud. The experiments clearly demonstrated that textiles can survive in a charred state in the remains of a pyre, particularly if they fall down into it during an early stage of burning. Some of these textiles were still in a stable state of preservation when the bones and burnt grave goods were collected after the cremation, and thus could have found their way even into the burial urn, together with the cremated human remains and other objects (Fritzl et al., 2021; Grömer, 2020; Grömer et al., 2023).

**(e) Wrapping of specific burial goods** Apart from the wrapping of the body, cremated remains, and urns, wrapping of specific objects in the graves also took place. According to Johanna Banck-Burgess (2014), this was a quite common practice in the Iron Age. She has assembled evidence with many examples from graves in Central Europe (for Switzerland, see also Rast-Eicher, 2008, esp. 178–180; for Italy: Gleba, 2012, Figs. 9.7–9.10). Wrapping of artefacts as a common practice can also be verified for the Early Middle Ages in Central Europe (e.g. Urbanová, 2010, 36–37).

From the author's own research in Austria, several examples of such practices can be described (Fig. 2.6). In the Iron Age, the wrapping usually covered sharp artefacts, such as knives, swords, and daggers (Grömer, 2014, catalogue p. 192–220). From the eighth to fifth century BCE, there is some evidence that the blades of swords were wrapped with approximately 5–8 cm wide ribbons. A few examples from Hallstatt in particular show very careful wrapping. In the Early La Tène period, the custom changed slightly; not the bare blades, but the sword scabbards were covered, sometimes with larger linen fabric pieces. One of the most impressive examples is the scabbard found in a Celtic warriors' grave at Gemeinlebarn in Lower Austria, dated to the fourth century BCE (Preinfalk & Preinfalk, 2014). Here, a larger piece of finely woven tabby was folded carefully over the scabbard of the sword. In this case, the weapon was placed next to the right side of the deceased, with his right hand lying on the scabbard together with the mineralized textile remains. It is usually unclear whether the packaging material, the pieces of cloth, was made specifically for this purpose (primary use), or whether old, recycled textiles were used (secondary use).

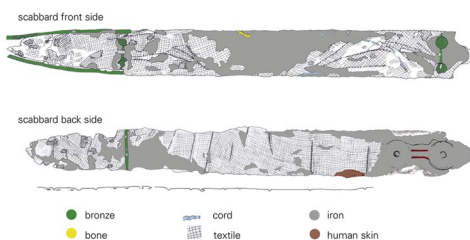
Wrapping was not only applied to sharp artefacts, but also other specific material categories, such as mirrors. In the cremation grave 130 at Tulln (Austria), from the early fourth century CE (Grömer, 2014, 163 and Taf. 36), a mirror covered by two kinds of fabrics was deposited in a grave next to the cremated remains. One is a tabby, with single yarns of 0.2 mm diameter and 20 threads per cm. The outermost textile layer is an open-weave with a 'veil-like' appearance (i.e. 8–9 threads per cm



Hallstatt



Gemeinlebarn



**Fig. 2.6** Wrapped swords from Iron Age contexts: (a) Hallstatt—sword blade wrapped in a textile ribbon; (b) Gemeinlebarn—scabbard wrapped in a sheet of fabric. (Images: Hallstatt: NHM Vienna; Gemeinlebarn: Grömer K)

using thin yarn with 0.3 mm thread diameter). Such rare fabrics can possibly be understood as special fabrics made for a funerary setting. The symbolism behind covering a mirror is also interesting, and should be considered as linked to a specific religious belief.

**(f) Wrapping of all objects in the burial** Systematic wrapping of all objects in the grave is best exemplified by the most prominent example, the previously mentioned princely grave of Eberdingen-Hochdorf (Banck-Burgess, 2012). Detailed analysis of all textile remains found in the grave demonstrated that all the objects in the grave were packed into textile covers—including the carriage, its wheels, and all burial goods. The large bronze cauldron was also wrapped in many precious materials. Hochdorf was one of the first finds in which this phenomenon was described in great detail. Recent research and detailed excavations in princely graves of the late Hallstatt period raise hope for more such spectacular finds, and more information on this exceptional but little-understood practice.

### 2.3.4 *Ritual Sphere—Textiles as Grave Goods*

Textiles and garments deposited together with the deceased person as burial gifts (and not actually worn by the deceased) are a specific feature in graves. Textile grave goods are clearly recognizable as well-preserved finds in Egyptian graves, where they were carefully laundered, folded, and sometimes placed in linen chests. In the case of fragmentary preservation, as archaeologists face in Central Europe, interpretation is more difficult.

Many of the precious fabrics from the princely grave of Eberdingen-Hochdorf can be seen as representative grave goods per se. One garment clearly served as a burial gift: a large fabric with a precious tablet-woven border was found hanging over the big cauldron (Banck-Burgess, 1999, 72–76, plates 24–29). The economic value of this burial gift might be similar to that of the bronze cauldron itself, as the fabric was very large, had a spin-patterned design, was dyed with woad, and decorated with a wide, complex patterned tablet-woven band.

Remnants of fabric that were deposited near the large bronze spirals in the cremation grave of Berg/Attergau in Austria (Grömer in Trebsche et al., 2007) may also represent a garment that was deposited with the dress accessories in the grave. Any such textile that were not deposited with bronze or iron objects, however, are unlikely to be attested in the graves of Central Europe.

For such textiles, dyestuff analysis has demonstrated that blue and red dyes were the most common—dyed with woad and madder, sometimes insect-based dyes. Perhaps colour played a symbolic role? Were those colours representative of the elites, or did they somehow carry a symbolic meaning for burials?

As known from contemporary Mediterranean cultures of the first century BCE, textiles are documented in written sources as valuable gifts, prestige gifts of equal value, and even as consecrated offerings to gods (Wagner-Hasel, 2006)—of equal value to bronze objects and jewellery.

### 2.3.5 *Functional Sphere—Technical Textiles*

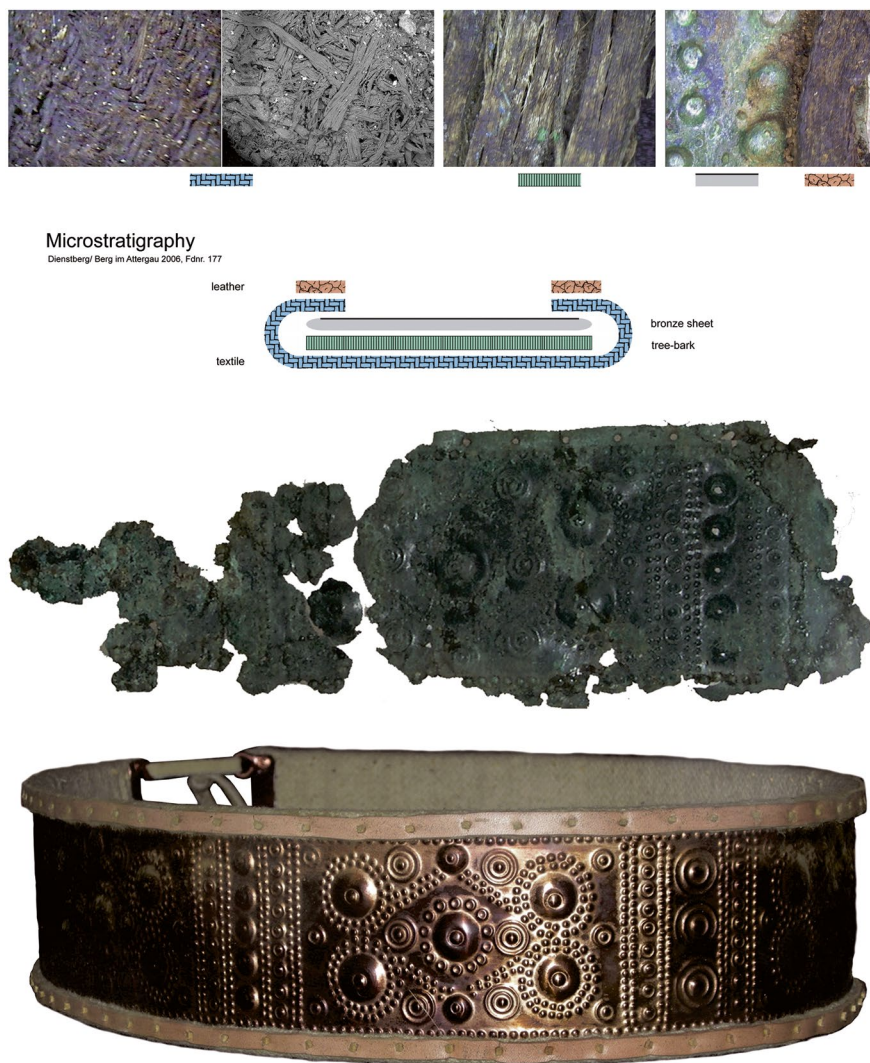
There can also be purely functional reasons as to why a textile appears in an archaeological grave context; these are sometimes called ‘technical textiles’. In these cases, the textile is an integral part of the functional structure of an object, e.g. a lining of a scabbard. This means that the textile was not put into the grave for itself, as a burial gift, wrapping, or clothing. Perhaps it was not even recognized as a textile at all when the item was deposited in the grave.

A particularly impressive piece of evidence of this type is the La-Tène-period sword scabbard from Horath in Germany (Haffner, 1976, 230, Fig. 62). The microstratigraphy of the artefact shows different organic and metal layers that can be described as follows: the wooden scabbard was lined on the inner side with some bedding made of flax fibres, then a tree bast layer, and finally the innermost layer was linen cloth (the layer that would have touched the sword blade). On the outside, the wooden scabbard was reinforced along the edges with metal sheet. Such textile linings of scabbards or sheaths for swords, daggers, or knives are well known from different periods (e.g. a Roman-period knife sheath from Austria: Grömer, 2014, Fig. 93).

Personal attire, such as metal sheet belts, could also have organic linings. Graves from the Hallstatt period in Central Europe sometimes contain bronze sheet belts, such as the one deposited as a burial gift in a cremation grave at Berg/Attergau in Austria (Trebsche et al., 2007; Grömer, 2016, Fig. 168). The functional layered structure of the belt was identified as follows (Fig. 2.7): stripes of thick tree bark were discovered directly on the inner side (back) of the bronze sheet, then several layers of textile. The textile layers were also folded around the edges of the bronze sheets and found on the face side of the belt. Above the textile, leather strips and wooden pins were detected on the front of the belt along the edges. Thus, the microstratigraphy of the belt can be explained as follows: the thin bronze sheet of the belt was stabilized on the inner side with tree bark. Additionally, multiple textile linings were attached to the back of the belt and bent over the edges to form narrow borders on the front face of the belt, which was then covered with leather strips and held together with wooden pins.

In such cases, the belt or the sword in its scabbard were the items that had importance during the burial rites—as precious grave goods to symbolize the status of the owner, a special social grouping, or something similar. The textiles themselves might not even have been recognized as such. Nevertheless, the textile remains in these graves still need to be analysed and interpreted by specialists.





**Fig. 2.7** Berg/Attergau and the composition of the bronze belt with its organic layers. (Images: Grömer K, Rudelics A)

### 2.3.6 Recycling

Although the existence of the textile lining of a belt or scabbard might have been known and acknowledged, textiles could also have been placed in graves without the funerary participants even knowing that they were there.

Female inhumation graves from Late Iron Age Austria and Slovakia, can contain hollow bracelets and anklets, in which textiles (among other materials, such as clay

or thin twigs) were used as filling. Examples from Austria include the anklets from Mannersdorf (Müllauer & Rams, 2007) and Schrattendorf (Grömer et al., 2019), which were filled with textiles made of medium-fine linen (Fig. 2.8). Tereza Belanová-Štolcová (2012) collected examples from Slovakia and the Czech Republic, the most important among them being from Nové Zámky. Five fragmented fabrics come from a pair of tubular anklets dated to around 400 BCE. All five fragments are of a linen tabby, with z-spun threads of 0.3–0.8 mm diameter thickness in both thread systems. The thread count was about 20–24 threads in the warp and 12–14 threads in the weft. Initial analyses have shown that these pieces were originally embroidered with a red woollen thread. The composition of the pattern has been identified as two plaited stripes with S-motifs and trumpets in the form of a *horn of plenty*.

This demonstrates that textiles have been recycled after their primary use to serve as filling for jewellery to stabilize the thin bronze sheet. Thus, these textiles had a technical function in the production of the bracelets and anklets.



**Fig. 2.8** Bracelets from Schrattenberg with textile filling. (Image: Schumacher A, NHM Vienna)

## 2.4 Discussion and Further Approaches

The interpretation of textiles from funerary contexts is complex, and goes far beyond the simple study of parts of the deceased's clothing. Different circumstances of deposition during funeral rites suggest the use of textiles for a variety of purposes. From the archaeological evidence in Central European prehistory and the Early Medieval period, six main purposes of textiles can be distinguished: (1) textiles used as garments for the deceased; (2) textiles used as grave decoration (e.g. soft furnishings for the grave chamber); (3) textiles serving as covers or wrapping for grave goods or the deceased (such as a shroud); and (4) textiles used as grave goods. In addition to these purposes, for which textiles have been used intentionally as part of the funeral and the specific rituals, (5) textiles can sometimes be found in graves as an integral part of other artefacts as 'technical textiles', and as such ended up in the grave without their presence being recognized. Examples are textile linings on sword scabbards or knife sheaths. (6) Recycled textiles are also identified among grave finds, such as the textile scraps stuffed into hollow bracelets of the early La Tène period.

As well as grouping them into functional and ritual categories of textile use, methodological approaches are required to define the different uses of textiles in graves, as will be outlined below. Especially the practice of using textiles as wrapping for grave goods has been recognized by various researchers before (e.g. Bank-Burgess, 2014; Gleba, 2014), and so the different theories about the potential meanings behind this custom are also discussed.

### 2.4.1 *Garments from Daily Life or Funeral Dress?*

The interpretation of the clothing worn by the deceased is crucial for understanding the function of textiles in graves, especially assessing whether such dress elements represent garments from daily use (or even a typical festivity costume) or a specific funeral dress (see also Grömer, 2014, 117–120). To tackle this research question, some general theoretical comments are necessary. Studying evidence from ethnography and history has unearthed evidence of specific *universalia humana et cultura* concerning funeral rites. Almost without exception, rites are performed between the moment of death and final deposition, which form part of the framework known in ethnology as '*rites de passages*' (Van Gennep, 1986 [1909], 142–144). These define the individual phases of the human life cycle (e.g. birth—transition into adulthood—marriage—death).

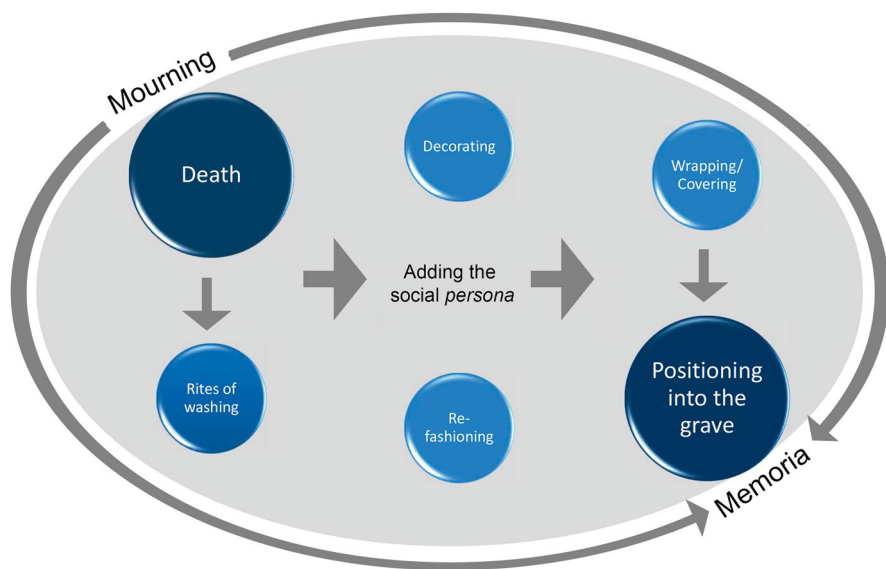
In nearly every society worldwide for which written records or oral sources are available, people who practise inhumation burials usually do not bury the deceased in the clothes the person was wearing at the point at which he or she died. The exact rites of passage may culturally differ, but mostly include rites of washing the dead body, and then re-fashioning, decorating, or wrapping it—all according to the ritual



beliefs and common religious practice of that society. These rites return its social identity back to the corpse. The rites thus enable the dead person to be transformed from a corpse into a buried member of that specific society—a respectful *memoria*, with the *social persona* being added through the rituals (Fig. 2.9).

The clothing recovered from an inhumation grave was an intentional selection and a message to the potential audience, as a textile-based form of non-verbal communication. The clothing (if any) which was added would have been quite specific, and therefore provides information as to what the persons who participated in the rite (close family or other persons with ritual duties) wanted to express. These messages could have concerned the identity of the deceased, their gender and age, social rank, group memberships, cult affiliation, and other potential aspects. In some cases, the final wishes of the person being buried may have also had an influence on the garments the corpse was dressed in. Also, specific religious rules must be considered as well as self-representation of the people participating the rite. Sometimes, the burial garments might have been specifically made for the dead person and for the occasion of their funeral rite.

Although the clothing of the deceased resulted from a conscious selection, it is important to ascertain if their burial garments were also worn during his/her lifetime. In the case of prehistoric Central Europe, traces of wear and tear on costume components are particularly interesting to track to resolve this dilemma. In a study of jewellery from Middle Bronze Age women's graves, it was found that rings, bracelets, and anklets usually show strong signs of wear and tear. From this, it was interpreted that these items were also worn in daily life (e.g. Wiegel, 1994, 165).



**Fig. 2.9** Schema of activities between death and burial for simple inhumation graves. (Image: Grömer K)

However, even if this can be proven for jewellery, it remains unclear whether the textile components of the clothing were also worn during the lifetime of the individual before they ended up in a grave. Here, more systematic survey of the material is needed.

In this context, another interesting—if rare—detail can be presented, which approaches this problem from a different perspective: *pediculus humanus corporis*—the human body louse. This parasite lives directly on people's clothing, and is bound to it as their primary habitat. Evidence for body lice is rare in grave contexts, but has been occasionally discovered. An example can be given from Roman Austria, at the site of Göttweig (Fig. 2.10) (Grömer, 2014, 231–232, cat. No. Rō-18): in a child's grave, a fine tabby textile was discovered on the inside of a metal bracelet (i.e. between the bracelet and the arm of the deceased child). As this is a Roman context, the textile can only come from a *tunica manicata*, i.e. a long-sleeved tunic with the bracelet slipped over the sleeve. A body louse was identified on the fabric during an investigation of the artefact using scanning electron microscopy. This is an important detail, providing crucial information arguing for the re-use of previously worn garments. Since the natural habitat of body lice is the living human, it means that this *tunica manicata* was also worn during life—it was not a funeral robe made specially for the burial. However, it is not possible to determine if the garment belonged to the dead child or someone else as, due to the small and fragmentary condition of the textile, there is no indication as to the sizing of the original garment.

According to an analysis by Johanna Banck-Burgess (Banck-Burgess, 1999, 124–126; 2012, 142–143), the textiles found in the princely grave of Eberdingen-Hochdorf indicate the opposite. Due to their arrangement, as well as how they were



**Fig. 2.10** Human body lice on a Roman-period bracelet in a child's grave at Göttweig, Austria. (Images: Grömer K, NHM Vienna, Project DressID)

produced (including specific raw materials, such as badger-hair textiles and mattress filling), the textile furnishings in the grave could very well have been made specially for the this funerary context. Whether the textiles and garments in a particular grave represent everyday gear during life or specific costumes for the dead must always be decided on a case-by-case basis.

### 2.4.2 *Interpretation of Wrappings and Coverings*

The interpretation of wrappings and coverings in graves has different levels—practical, as well as metaphysical.

**Functional-Practical Level** Coverings can initially be interpreted on the functional-practical level, e.g. simply as a cover for the safekeeping of items (Gleba, 2014, 142). Thus, textile remains together with small bones in cremation burials might be the remnants of textile bags used as containers, just like an urn. The main purpose of the textile container would have been to ensure that none of the human remains were lost. Textile coverings for the human remains selected from a pyre can also have been made of valuable materials, as described by Homer (Iliad 34.796 and 23.254): Hector's bones are wrapped in rich purple fabrics and then placed in a golden ash box (*larnax*) before they are buried in a tumulus. The most spectacular evidence of this practice comes from the so-called tumulus of Philip II in Vergina, Greece, dated to the second half of the fourth century BCE. The cremation of a woman was discovered in an antechamber of grave 2 in the large tumulus, wrapped in a gold and purple patterned fabric and deposited in a golden *larnax* (Andronikos, 1984).

Anton Kern (2005, 8) also suggests that the textile wrappings of the sword blades found in the Early Iron Age cemetery of Hallstatt might have served as protection against rusting—especially if the textiles were soaked with oil or fat.

For Barbara Fath (2012), it is essential to note that fabrics did not only have a protective and decorative function, but also a ritual and prestige effect in the grave cult—as a status indicator, alongside jewellery and bronze objects. In a study of Early Iron Age cremation graves in northern Italy and the Eastern Alps, she analysed the staging of textiles and their production. She argues that fabrics, textile tools, and pictorial representations of spinning and weaving scenes were deliberately embedded into the graves to represent a specific kind of textile-related (maybe textile-production-related) identity of the deceased.

**Metaphysical Level** Textile coverings in graves can also be interpreted on a metaphysical level because of their context, as they have an important function in burial rites. They continue to serve various roles during the rites of passage that take place after a person has died. Textiles support the psychological, symbolic, and physical transformation of a wrapped corpse and/or grave goods, which facilitates their transition into the afterlife (Harris & Douny, 2014).

Such a transformation can also be seen in the bending or deliberate destruction of weapons before giving them to the dead. The early La Tène cemetery at Pottenbrunn in Austria has provided impressive examples of destroyed swords (e.g. Gr. 854, 855, 975 and 1005: Ramsel, 2002, Taf. 72/4, 73/5, 76/11, 80/7). Such a ritual of ‘destruction of’ or ‘rendering useless’ objects that are placed in the grave is also seen in the Etruscan custom of covering mirrors with textiles (Gleba, 2014, 142). Perhaps there was a taboo forbidding the placement of bare metal in the grave.

Johanna Banck-Burgess (2014, 153–154) has analysed textiles in relation to various objects that indicate the social status of the deceased. She asks an important question concerning the timing of the covering of those artefacts with textile wrappings; was it already completed during the various rites of the laying out of the dead and mourning, or just before the burial chamber was locked? She also argues that the act of wrapping creates a status of ‘invisibility’ for the objects. This is supposed to create a boundary between the dead and the living—even some form of physical barrier (Banck-Burgess, 2012). What belonged to the dead must be hidden, also to protect the living from the influence of the deceased. She interprets concealment as a kind of communication between the living and the dead.

Margarita Gleba (2014, 140–141) also argues that a distinction needs to be made as to whether objects are made ‘invisible’ by being wrapped, or whether, on the contrary, they gain visibility through the precious textiles that might have been used to cover them. She suggests that urns were partly re-anthropomorphized by ‘clothing’ with textiles and decorating them with ribbons. Such rites can be noted, especially in northern and central Italy.

## 2.5 Perspectives

In conclusion, the kind of evidence provided by textiles in graves can be very diverse. Some have to be interpreted on the functional level, others on the ritual level, but they can also have elements of both. Nevertheless, it is essential to emphasize that the religious ideas and world views that stand behind these rites cannot be fully deciphered for prehistory due to the lack of written sources. In this context, textiles offer us faint but very precious clues about unknown rites and their meaning.

The inclusion of any type of textile grave equipment, such as wall hangings or floor coverings, was part of a conscious arrangement of textiles in graves. Every kind of garment in which the deceased was clothed was important for the funerary rite, but also served to represent the identity of the person. Here, some critical thoughts have been offered to help differentiate between garments of the deceased that were everyday clothing worn during life and those that represent a specific burial costume.

The ritual level includes all those textiles that had a specific role during the funeral. Many of the textiles in graves can be interpreted in this sense. Some textile finds should also be addressed as direct textile grave goods, probably equal in their value to other grave goods, such as bronze vessels or similar items. The rite of

covering or wrapping the corpse, cremated bones, and objects is often documented for the Iron Age in Austria and Central Europe. In the last few years in particular, many theories on the meaning of these practices have been published.

In addition to the functional level, it might be the case that certain textiles were not deliberately deposited in the grave but were present as ‘technical textiles’, i.e. as a functional component of another object, for example as the inner lining of a sword, dagger, or knife sheath. Moreover, some textiles have been found in graves that should actually be regarded as ‘recycled’ products, i.e. those that were stuffed into hollow sheet metal objects from the La Tène period.

In this contribution, an attempt has been made to systematize the various functions of textiles in graves. Nevertheless, there may be overlaps when modelling the meanings of individual objects. Textiles that were deposited as grave goods and those that were used to decorate the grave, as well as coverings, were certainly integrated into an overall ritual context. The specific differences between cremation and inhumation burials have not been discussed in detail, with the exception of the fact that the clothing of the deceased can only be directly attested in inhumation burials. Due to the lack of written records in prehistoric Central Europe, it is difficult to understand which beliefs and ritual considerations led to the grave contents uncovered in the archaeological record. For later periods, such as the Roman or Early Medieval periods, written and pictorial sources may help in the interpretation of funerary textiles.

**Acknowledgements** The author would like to thank the anonymous reviewers for their valuable comments during the elaboration of this chapter.

## References

- Andronikos, M. (1984). *Vergina: The royal graves*. Ekdotike Athenon. Athens.
- Banck-Burgess, J. (1999). Hochdorf IV. Die Textilfunde aus dem späthallstattzeitlichen Fürstengrab von Eberdingen-Hochdorf (Kreis Ludwigsburg). In *und weitere Grabtextilien aus hallstatt- und La Tènezeitlichen Kulturgruppen. Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg* 70. Theiss.
- Banck-Burgess, J. (2012). Case study: The textiles from the princely burial at Eberdingen-Hochdorf, Germany. In M. Gleba & U. Mannering (Eds.), *Textiles and textile production in Europe from prehistory to AD 400. Ancient textiles series 11* (pp. 139–152). Oxbow Books.
- Banck-Burgess, J. (2014). Wrapping as an element of early Celtic burial customs: The princely grave from Hochdorf and its cultural context. In S. Harris & L. Douney (Eds.), *Wrapping and unwrapping material culture (University College London, Institute of Archaeology publications 64)* (pp. 147–156). Left Coast Press.
- Belanová-Štolcová, L. (2012). Slovak and Czech Republic. In M. Gleba & U. Mannering (Eds.), *Textiles and textile production in Europe from prehistory to AD 400. Ancient textiles series 11* (pp. 306–333). Oxbow Books.
- Cleland, L., Davies, G., & Llewellyn-Jones, L. (2007). *Greek and Roman dress from A–Z*. Routledge.
- Croom, A. T. (2002). *Roman clothing and fashion*. Tempus.
- Fath, B. (2012). Spinnen und Weben—Verhüllen und Verknüpfen. Textilherstellung und deren Darstellung in Gräbern der Frühen Eisenzeit Oberitaliens und im Ostalpenraum. In

- Technologieentwicklung und -transfer in der Eisenzeit. Tagung Hallstatt 2009. Beiträge zur Ur- und Frühgeschichte Mitteleuropas* 65 (pp. 71–81). Beier & Beran.
- Fritzl, M., Grömer, K., Konrad, M., & Pieler, F. (2021). Long term experiment: Middle Bronze Age tumulus. Langzeitexperiment: Mittelbronzezeitliche Grabhügel. In: Auenmüller J (Ed.), *Experimental archaeology. An exhibition by MAMUZ in cooperation with Exarc.net* (pp. 142–147). Weinviertel Museum Betriebs GmbH.
- Gleba, M. (2012). Italy: Iron age. In M. Gleba & U. Mannering (Eds.), *Textiles and textile production in Europe from prehistory to AD 400. Ancient textiles series* (Vol. 11, pp. 215–241). Oxbow Books.
- Gleba, M. (2014). Wrapped up for safe keeping: “Wrapping” customs in early Iron Age Europe. In S. Harris & L. Douny (Eds.), *Wrapping and unwrapping material culture (University College London, Institute of Archaeology publications* 64) (pp. 135–146). Left Coast Press.
- Grollegger, E. (2002). Textilien aus dem spätantiken Gräberfeld auf dem Frauenberg bei Leibnitz, Stmk. In Steinklauber U, *Das spätantike Gräberfeld auf dem Frauenberg bei Leibnitz, Steiermark. Fundberichte aus Österreich Mat A 10* (pp. 409–410). Berger, Horn.
- Grömer, K. (2014). Römische Textilien in Noricum und Westpannonien – im Kontext der archäologischen Gewebefunde 2000 v. Chr. – 500 n. Chr. in Österreich. *Austria Antiqua* 5. UPG Uni-Press Graz.
- Grömer, K. (2016). The art of prehistoric textile making—The development of craft traditions and clothing in Central Europe. In *Veröffentlichungen der Prähistorischen Abteilung* 5. Naturhistorisches Museum Wien.
- Grömer, K. (2020). Wieviel Textil bleibt übrig bei einer Brandbestattung? Experimentelle Kremationen Inzi18 und Inzi19. In G. Schöbel (Ed.), *Experimentelle Archäologie in Europa. Jahrbuch* (pp. 68–82). Oldenburg.
- Grömer, K., & Grassberger, M. (2018). Organic remains from archaeological contexts. Forensic taphonomy applied to prehistoric and early medieval inhumation graves. In *Proceedings 8th International Meeting on Taphonomy and Fossilization, 14th–17th September 2017, Vienna, Austria. Neues Jahrbuch für Geologie und Paläontologie, Abh.* 289/2 (pp. 203–216). Stuttgart.
- Grömer, K., Ramsil, P., Wilschke-Schrotta, K., & Wollmann, J. (2019). *La Tènezeitliche Gräber aus Schratzenberg mit „Torques“ und Textil. Annalen des Naturhistorischen Museums Wien, Serie A* 121 (pp. 5–33). Naturhistorisches Museum Wien.
- Grömer, K., Gleba, M., & Van Horne, S. (2023). Textiles burning: Understanding charred textiles from cremation graves and experimental charring. In S. Lipkin, E. Ruhl, & K. Wright (Eds.), *Interdisciplinary approaches to research of North and Central European archaeological textiles* (pp. 309–322). Monographs of the Archaeological Society of Finland 12.
- Haffner, A. (1976). *Die westliche Hunsrück-Eifel-Kultur. Römisch-Germanische Forschungen* 36. de Gruyter.
- Hägg, I. (1989). Historische Textilforschung auf neuen Wegen. *Archäologisches Korrespondenzblatt*, 19, 431–439.
- Harris, S., & Douny, L. (2014). *Wrapping and unwrapping material culture. Archaeological and anthropological perspectives. University College London, Institute of Archaeology Publications* 64. Left Coast Press.
- Kern, A. (2005). Hallstatt—eine Einleitung zu einem sehr bemerkenswerten Ort. In P. Bichler, K. Grömer, R. Hofmann-de Keijzer, A. Kern, & H. Reschreiter (Eds.), *‘Hallstatt textiles’ technical analysis, scientific investigation and experiment on iron age textiles. BAR Int. series* 1351 (pp. 1–10). Archaeopress.
- Liddel, H. G., & Scott, R. (2007). *A greek-english lexicon* 9. Clarendon Press.
- Martin, T. (2014). (Ad)dressing the Anglo-Saxon body: Corporeal meanings and artefacts in early England. In P. Blinkhorn & C. Cumberpatch (Eds.), *The chiming of Crack’d bells: Recent approaches to the study of artefacts in archaeology. Brit Archaeol rep Int Ser* 2677 (pp. 27–38). Archaeopress.

- Mitschke, S. (2001). *Studie zu ausgewählten Funden aus dem Gräberfeld von Eltville, Rheingau-Taunus-Kreis (5.-8. Jh. n. Chr.)*. Vorgeschichtliches Seminar Philipps-Universität Marburg. Kleine Schriften 51.
- Müllauer, N., & Ramsl, P. C. (2007). Herstellungstechnische Untersuchungen an Hohlblechreifen aus dem La Tènezeitlichen Gräberfeld von Mannersdorf am Leithagebirge, Niederösterreich. *Archäologisches Korrespondenzblatt*, 37, 67–84.
- Nowak-Böck, B., & Voß, H. (2015). Standardised mapping system for the digital documentation of organic materials on metal finds and in-situ-blocs. *Archaeological Textiles Review*, 57, 60–69.
- Pader, E. J. (1980). Material symbolism and social relations in mortuary studies. In P. A. Rahtz, T. Dickinson, & L. Watts (Eds.), *Anglo Saxon cemeteries 1979: The fourth Anglo-S symposium of Oxford*. Brit Archaeol Rep Brit Ser. 82.
- Paetz gen. Schieck, A. (2012). A late Roman painting of an Egyptian officer and the layers of its perception. In M. L. Nosch (Ed.), *Wearing the cloak* (pp. 85–108). Oxbow Books.
- Póczy, K. (1999). What the mummy burials in late Roman Pannonia reveal. *Antaeus*, 24, 420–442.
- Preinfalk, A., & Preinfalk, F. (2014). Ein reich ausgestattetes Kriegergrab der La Tènezeit aus Gemeinlebarn. In E. Lauer mann & P. Trebsche (Eds.), *Beiträge zum Tag der Niederösterreichischen Landesarchäologie 2014, Katalog des Niederösterreichischen Landesmuseums N.F. 51* (pp. 42–49). MAMUZ.
- Ramsl, P. C. (2002). Das eisenzeitliche Gräberfeld von Pottenbrunn. In *Fundberichte aus Österreich Mat. A11*. Bundesdenkmalamt.
- Rast-Eicher, A. (2008). *Textilien, Wolle, Schafe der Eisenzeit in der Schweiz*. Antiqua 44. Archäologie Schweiz.
- Rebay-Salisbury, K. (2012). Inhumation and cremation: How burial practices are linked to beliefs. In M. L. Sørensen & K. Rebay-Salisbury (Eds.), *Embodied knowledge: Historical perspectives on technology and belief* (pp. 15–26). Oxbow Books.
- Sørensen, M. L. (1991). Gender construction through appearance. In W. Dale & N. D. Willows (Eds.), *The Archaeology of Gender: Proceedings of the Twenty-Second Annual Conference of the Archaeological Association of the University of Calgary*. Calgary.
- Sørensen, M. L. (1997). Reading dress: The construction of social categories and identities in Bronze Age Europe. *Journal of European Archaeology*, 5(1), 93–114.
- Steinklauber, U. (2002). Das spätantike Gräberfeld auf dem Frauenberg bei Leibnitz, Steiermark. *Fundberichte aus Österreich Mat A 10*.
- Štolcová, T., & Zink, G. (2013). Early migration period textile and leather finds from the Chieftain's grave in Poprad-Matejovce: Discovery, retrieval and new results of the laboratory examination. In J. Banck-Burgess & C. Nübold (Eds.), *The North European Symposium for Archaeological Textiles XI (NESAT XI)* (pp. 85–92). Verlag Marie Leidorf, Rahden/Westfahlen.
- Trebsche, P., Pollak, M., & Gruber, H. (2007). Eisenzeitliche Hügelgräber im Attergau. *Fundberichte aus Österreich Materialheft A5, Sonderand*.
- Urbanová, K. (2010). Shroud or burial dress? Possibilities for interpreting textile fragments from the migration period found on the site Záluzí near Celákovice. In J. Maik (Ed.), *Fasciculi Archaeologiae Historicae* (pp. 31–38). Fasciculus XXIII.
- Van Gennep, A. (1986) [1909]. *Übergangsriten* (Original 1909: *Les rites de passage. Étude systématique des rites*). Campus Verlag.
- Vedeler, M., Kristoffersen, S., & Røstad, I. M. (2018). Dressed for ritual, dressed for life. A migration-period grave from Sande in Norway. *Medieval Archaeology*. <https://doi.org/10.1080/000766097.2018.1451470>
- Von Falck, M. (1996). *Ägypten. Schätze aus dem Wüstensand. Kunst und Kultur der Christen am Nil. Katalog. Eine Ausstellung der Stiftung Preußischer Kulturbesitz und des Gustav-Lübcke-Museums der Stadt Hamm*. Reichert.
- Wagner-Hasel, B. (2006). Gift exchange: Modern theories and ancient attitudes. In S. Deger-Jalkotzy & I. S. Lemos (Eds.), *Ancient Greece: From the Mycenaean palaces to the age of Homer* (pp. 257–269). Edinburgh University Press.



- Walton, P., & Eastwood, G. (1988). *The cataloguing of archaeological textiles*. Institute of Archaeology Publications.
- Wiegel, B. (1994). *Trachtkreise im südlichen Hügelgräberbereich*. *Internationale Archäologie* 5. Leidorf.

**Karina Grömer** is the Head of the Department of Prehistory, Natural History Museum Vienna. She studied Prehistoric Archaeology, Ethnology and Anthropology at the University of Vienna in Austria. Her habilitation thesis (2019) was entitled “Archaeological Textile Research—Technical, Economic and Social Aspects of Textile Production and Clothing from Neolithic to the Early Modern Era”.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.





# Chapter 3

## Fabrics and Funerals: An Ethnographic Enquiry



Estella Weiss-Krejci

**Abstract** In recent years, textiles have become an increasingly relevant category for archaeological burial analysis. However, their ideological and socio-religious dimensions have not yet been satisfactorily explored. The present study provides a cross-regional ethnographic overview of the different types and uses of textiles and skins in the various phases of funeral rites. It is based on data from about 50 societies from all over the world, mainly from the nineteenth and twentieth centuries, selected from the eHRAF World Cultures database. The study confirms that in the case of a regular burial, it can almost always be assumed that the deceased was clothed. It also shows that the mourning dress worn by the bereaved is not only often the opposite of everyday dress, but is also subject to conventions that reflect the economic status and kinship of the bereaved. Above all, it suggests that there is a close link between the specific use of textiles on the body of the deceased and the eschatological concepts of a society. The study advocates the exploration of ethnographic data for a better overall understanding of the significance of textiles in funerals.

**Keywords** Textile research · Funeral ritual · Treatment of the corpse · Mourning · Archaeology of death and burial · Human Relations Area Files (HRAF)

---

E. Weiss-Krejci (✉)

Department of Historical Archaeology, Austrian Archaeological Institute, Austrian Academy of Sciences, Vienna, Austria

Institute of Prehistory, Protohistory and Near-Eastern Archaeology, Heidelberg University, Heidelberg, Germany

e-mail: [Estella.Weiss-Krejci@oeaw.ac.at](mailto:Estella.Weiss-Krejci@oeaw.ac.at)

© The Author(s) 2025

E. Yvanez, M. M. Wozniak (eds.), *Funerary Textiles in Situ*, Interdisciplinary Contributions to Archaeology, [https://doi.org/10.1007/978-3-031-69461-5\\_3](https://doi.org/10.1007/978-3-031-69461-5_3)

### 3.1 Introduction

Textiles and skins used to wrap, bind, stuff, and clothe the dead are among the most elusive materials in archaeology, as their presence and significance can often only be assumed. Technological advances in textile research (cf. Anderson Strand et al., 2022), improved excavation and sampling techniques (Bolohan & Lazanu, 2018; Mitschke & Paetz, 2012), the revisiting of old excavation reports and museum collections (Yvanez, 2016), and archaeothanatological methods (Cartron & Zémour, 2022; James, 2022; Knüsel & Robb, 2016: 668; Nilsson Stutz & Larson, 2016) have contributed to textiles becoming a viable category for archaeological mortuary analysis. While the number of scientific publications on funerary textiles is rapidly increasing (Kashirskaya et al., 2020; Li et al., 2021; Ogalde et al., 2023) and the question of their socio-economic significance in past societies is also attracting growing interest (Basso Rial et al., 2021; Siennicka, 2020; Ulanowska & Siennicka, 2018: 43–44), considerations of the ideological and socio-religious dimensions have fallen somewhat behind. This chapter therefore has two objectives: firstly, to provide a cross-regional overview of the different types and uses of textiles in the various stages of funerary rites, very much in the tradition of earlier works on the subject (Crawley, 1931: 91–111; Jones, 1967; Schneider, 1987: 410–411), and secondly, to illustrate the intrinsic relationship between rites of passage and technology (cf. Garwood, 2011: 265) by drawing attention to eschatological concepts that might explain the use of specific materials, manufacturing techniques, and practices in clothing the dead. The study is informed by ethnographic research from around the world, predominantly from the nineteenth and twentieth centuries. As previous ethnoarchaeological approaches to archaeological textiles have shown (e.g. Hardy, 2008), ethnographic sources can make a valuable contribution to what should be the aim of archaeological research, namely to create ‘a better understanding of people and societies in the past and present’ (Sørensen, 2017: 108).

The chapter begins with a photograph of a deceased Karo Batak woman taken prior to her cremation (Fig. 3.1).<sup>1</sup> The picture was captured by a photographer from Berastagi, North Sumatra approximately one century ago. The dead woman is surrounded by mourners and rests on a mat made of pandanus leaves supported by a bamboo stretcher. Her hair is concealed by a scarf, her nostrils are plugged, probably with cotton, and her ears are adorned with the characteristic heavy spiral silver jewellery called *padung padung* (Sibeth, 2012). The rest of her body is covered with a woven cotton funerary textile. As elsewhere in Indonesia, different types of *uis* (the Karo word for cloth)—*ulos* among the Toba Batak (Niessen, 2009)—play an

---

<sup>1</sup>The photo derives from a photo album in the collection of Reinhold Mittersaksmöller, Vienna, to whom I owe all the additional information. The photograph once belonged to a student of the Planters School Vereniging in Berastagi, North Sumatra, Indonesia, which was founded by the Dutch in the 1920s in the then Dutch East Indies. The boarding school achieved a certain notoriety because the Dutch poet Rudy Kousbroek described the time he spent there as a pupil from 1939 to 1942 as a reign of terror, a negative assessment that has been debunked by van der Kaay and Ponsen (2013).



**Fig. 3.1** Deceased Karo Batak woman and mourners prior to the cremation ritual. (Photo possibly taken by Y. Asada between 1920 and 1927; from a photo album, dated 1927, in the collection of Reinhold Mittersakschmöller, Vienna)

important role in rites of passage, not only as coverings for the corpse and as mourning clothes (Lubis et al., 2020: 163–65) but also in ceremonial gift exchange (Gittinger, 1990: 19–25; Kipp, 1979; Niessen, 1993; Sinulingga & Tampubolon, 2020). A handwritten German text accompanying the photo<sup>2</sup> informs us that among the Batak, corpses are laid out on a funeral pyre and cremated in an open field; the ashes are then scattered in all directions or sometimes buried. It often takes a whole day (especially when it rains) until the corpse is completely burnt, the fire being stoked by an old woman who moves the fuel around with a stick. Unfortunately, there is no accompanying information on whether the textiles and ear jewellery were burnt or removed prior to cremation. The photograph thus alludes to a range of issues that concern those working with archaeological textiles, from design and colour to the social fabric in which funerary textiles are produced, exchanged, and used. Above all, however, it points to a major research bias in mortuary analyses by demonstrating to us an abundance of objects made of perishable materials, most of which are archaeologically invisible.

This study draws on the eHRAF World Cultures, one of two online databases operated by the Human Relations Area Files (HRAF).<sup>3</sup> Founded in 1949 by George Peter Murdock as an inter-university organization based at Yale University, HRAF's

<sup>2</sup>The derogatory comments that are part of this description have been deliberately omitted here.

<sup>3</sup><https://hraf.yale.edu/>

mission is to promote worldwide comparative studies to understand cultural diversity and commonalities (Ember, 2000). The eHRAF World Cultures database includes English-language ethnographic monographs, journal articles, dissertations, unpublished studies, and translations of non-English publications.<sup>4</sup> At the time of this research, eHRAF World Cultures included 6678 documents (2,584,880 paragraphs) of 361 cultures, divided into eight regions, 37 subregions, and eight subsistence types.<sup>5</sup> The cultures are classified into Hunter-gatherers (n = 59), Primarily Hunter-gatherers (n = 30), Horticulturalists (n = 60), Other Subsistence Combinations (n = 50), Pastoralists (n = 20), Agro-pastoralists (n = 28), Intensive agriculturalists (n = 79), and Commercial economy (n = 29). The eHRAF World Cultures database is subject-indexed at the paragraph level, and can be searched by indexed cultures, by a subject classification system, and by keywords. This facilitates the formulation of cross-cultural hypotheses, coding, statistical testing (e.g. Carr, 1995; Ember, 2007; Ember et al., 2023; White et al., 2017), and overviews, such as the one presented here. Despite good general coverage, not all regions and sub-regions are equally represented.<sup>6</sup> Moreover, not all ethnographers have devoted the same attention to textiles and funerals, and ethnographies of cultures grouped under one ethnonym at times provide contradictory information. This is partly due to great intracultural variability, but also to the fact that funeral rites, materials, and techniques have changed rapidly over time within individual groups. All these obstacles aside, eHRAF World Cultures offers valuable insights into the significance of plant- and animal-derived fabrics in funerary rituals.

In this paper, the use of textiles and skins is discussed on the basis of about 50 cultures. This selection is part of a much larger sample generated by the author through a search of the entire eHRAF World Cultures index, combining the eHRAF subject categories 'Special Garments', 'Life And Death', 'Dying', 'Suicide', 'Mourning', '(Special) Burial Practices And Funerals', and 'Mortuary Specialists' with textile-relevant keywords.<sup>7</sup> The selection strives for a balanced representation of the most important aspects of funerary textiles, and covers eight regions and seven of the eight subsistence categories (Commercial economy was omitted).

<sup>4</sup>In the case of translations of non-English ethnographies in the database, the author of this paper has made reference to the original publications.

<sup>5</sup>Six cultures are not assigned to any subsistence type. The subregions and cultures are divided as follows: Africa (five subregions, 71 cultures); Asia (six subregions, 81 cultures); Europe (five subregions, 17 cultures); Central America and the Caribbean (five subregions, 20 cultures); Middle East (one subregion, 12 cultures); North America (six subregions, 80 cultures); Oceania (four subregions, 33 cultures); and South America (five subregions, 47 cultures).

<sup>6</sup>For example, Sumatra and the Batak mentioned above are not covered; Australia includes only the Aranda and the Tiwi.

<sup>7</sup>E.g. 'bark', 'blanket', 'cloth', 'clothe', 'cord', 'costume', 'cotton', 'dress', 'fabric', 'feather', 'fibre', 'fiber', 'flax', 'fur', 'garb', 'garment', 'glove', 'hammock', 'hemp', 'hide', 'leather', 'linen', 'loin', 'mat', 'mitten', 'naked', 'nakedness', 'net', 'nude', 'nudity', 'sandal', 'sew', 'sewn', 'shoe', 'shoes', 'shroud', 'silk', 'spindle', 'string', 'swaddle', 'wash', 'washed', 'whorl', 'wool', 'woollen', 'weave', 'wrap', and 'yarn' (including the plural form of nouns and the present participle and past tense of verbs, as well as adjectives and adverbs).

This paper focuses on the funeral period (or ‘funerary cycle’), defined as the time between a person’s death and the end of mourning (Boulestin & Duday, 2006: 156–57; Van Gennep, 1909: 209–36; Weiss-Krejci, 2011: 69–76). When a person dies, a series of gradual transformations are set in motion that affect the bereaved, the corpse, the soul(s) or essences, and the former possessions of the deceased (Durkheim, 1912; Hertz, 1907; Metcalf & Huntington, 1991; Nilsson Stutz, 2015; Parker Pearson, 2000: 5–15; Robb, 2013; Valentin et al., 2014; Weiss-Krejci, 2015). According to Arnold van Gennep (1909: 209–36), the funeral period can be divided into three phases: a phase of separation, a phase of transition, and a phase of reintegration. Textiles play an important role in all of them. Since the funeral period is clearly limited, the role of textiles in relic cults (eHRAF subject category ‘Cult of The Dead’) is not dealt with here. Sainly relics are often only recovered and refurbished decades or centuries after the death of a revered person (Boulestin & Duday, 2006: 158; Weiss-Krejci, 2011: 77–80) and thus fall outside the scope of this study.

The following presentation is divided into five parts, and deals with those aspects that have yielded the most significant results in the course of the research: Sect. 3.2 describes the treatment and clothing of the body and its preparation for transport to the grave; Sect. 3.3 discusses some of the underlying beliefs; Sect. 3.4 looks at naked bodies and tests whether the dead are always buried clothed; Sect. 3.5 discusses the dress—and in some cases nakedness—of the mourners; and Sect. 3.6 deals with textiles during and after the disposal of the body. Regardless of whether a particular funeral ritual is still practiced in the same way today, the following ethnographic accounts are in the present tense.

### 3.2 Preparation, Treatment, and Clothing of the Corpse

The first phase of the funeral period usually begins soon after death, and can range from minor preparations and clothing of the dead body to more time-consuming forms of processing, such as evisceration, excarnation, and mummification. Although corpses are often dealt with in some way, treatment and clothing are not universals. When mourning is brief and the phases of separation and reintegration follow one another rapidly—as is often the case among hunter-gatherers, horticulturalists, and pastoralists—the funeral can be over quickly. One of the simplest ways to deal with a dead body is to leave it unaltered at the place of death. The northern Mbuti archers of the Ituri forest in the Democratic Republic of Congo, for example, dispose of the dead body by leaning it against a tree. When someone dies in a hut, people will leave the corpse there until decomposition sets in and then abandon camp (Turnbull, 1965: 182). The Hadza in the Lake Eyasi area, Tanzania, leave the bodies of young people in the bush for the hyenas to eat, whereas the bodies of older people who have died in their huts remain there. The hut is demolished and set on fire, before the group moves away (Marlowe, 2010: 65). The Sirionó from the eastern lowlands of Bolivia wrap the body in two mats of *Motacu* palm leaves and place it on a platform in the house. Afterwards, they leave the house and

move to a new location. Mourning lasts for only three days (Holmberg, 1950: 87). Among the Pumé (Yaruros) of the Capanaparo River, Venezuela, on the morning after a person's death, the body is washed, wrapped in a hammock, but then immediately taken to the burial ground where it is interred in the hammock (Petrullo, 1939: 226).

More frequently, before a body is transported to the grave, burnt on a pyre, put in the water, or fed to scavenging animals, it is first prepared by washing, anointing, binding, wrapping, and dressing; more elaborate treatments may include embalming, disembowelling, and mutilation (Carr, 1995: 130). Textiles may serve to wash the dead, to plug the bodily orifices, or to fill the abdominal cavity after evisceration. The dead are sometimes bound with ropes or leather straps, wrapped in single or multi-layered sheets, blankets, mats, or hides, and sewn into shrouds, coats, or mantles, naked or clothed. Sheets, mats, skins, pillows, and litters can be used to support the body. The dead may be dressed in their everyday clothes or in their best garb. In some societies, a special funeral garment is kept on hand, or made or acquired by the survivors after death. Many of these practices use textiles made from plant and animal fibres (bark cloth, cotton, wool, etc.) or hides and skins from wild or domestic animals, but the range is wide. While in some societies the status of the individual is emphasized by the wealth and quality of the textiles, other societies downplay such differences and dress all the dead more or less uniformly (cf. Schneider, 1987: 411).

To wash the corpse, the Berbers of Morocco use a woollen cloth, which is subsequently thrown away along with the pot in which the washing water had been kept. Then, the corpse is wrapped in a sheet that traditionally was made of wool but had been substituted by cotton at the time of the ethnographic study in 1926/1927. If death occurs early in the day, the body is taken to the grave on the same day. If death occurs in the late afternoon, the shrouded corpse is left in the house overnight (Coon, 1931: 143). Among the Kazakhs of Central Asia, the body is washed and, according to the Islamic funeral provisions, laid to rest as soon as possible, usually on the next day. To bring a deceased Kazakh to the grave, a litter is made from tent panels. If the burial place is far away, the corpse is carried by a camel (Grodekov, 1889: 256). Transport by camel has also been documented for the Kyrgyz (Fig. 3.2).

The Shilluk of Sudan adorn their chiefs with beads around the arms, neck, and waist, and a leopard skin around the loins. The body is wrapped in a white cloth and in a cowhide. For common people, however, the fur is not from a leopard but from a serval, and if the dead person is a woman or a girl, a skirt is used instead of the fur, and strings of beads are added for the girl. Wealthier families prefer white cotton cloth as wrapping, around which a cowhide is tied (Dempsey, 1955: 96). Among the Barundi of Burundi (former German East Africa), the bodies of executed criminals are thrown into the bush to be eaten by hyenas, while the usual method of burial is to dispose of the body in the ground a few hours after death. The body is not washed, but left in its normal clothing, at best wrapped in an old mat. This practice is fundamentally different from the treatment of the Barundi kings, whose bodies are first wrapped in skins and bark cloth, and then smoked over a fire until they are completely mummified. After a month, the desiccated bodies are taken to the

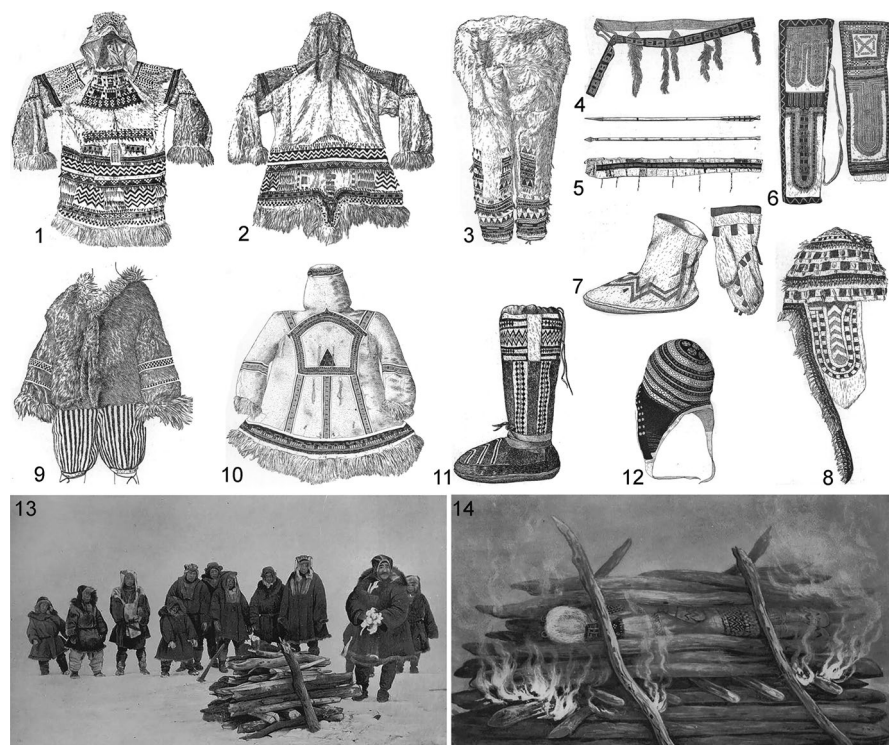




**Fig. 3.2** Preparing for a Kyrgyz funeral; a man on a horse leading a camel with a corpse to the burial place. (Photo taken between 1865 and 1872; Aleksandr L. Kun *Turkestan Album* DK854. T87 1872, pt. 2, vol. 1, pl. 75, no. 234; Library of Congress Prints and Photographs Division Washington, D.C. 20540, LC-DIG-ppmsca-14452)

north-western border mountains with Rwanda, and finally buried in a forest that only members of the royal family and the priests are allowed to enter (Meyer, 1916: 176–78). Embalming was also observed in nineteenth-century Samoa by missionary George Turner in a family of chiefs. After the viscera have been removed and buried the day after death, the body is pierced with fine needles for two months to drain out all fluids. Once the corpse is completely desiccated, the abdomen is filled up with ‘folds of native cloth’ and the body wrapped up with the same material, ‘leaving the hands, face, and head exposed’ (Turner, 1884: 148). In a house built especially for this purpose, the body is then permanently laid out on a mat made of leaves of a pandanus species, over which a sheet of ‘native cloth’ is loosely thrown (Turner, 1884: 120, 148). The ‘native cloth’ consists of the inner bark of *morus papyrifera* (paper mulberry) ‘beaten out on a board, and joined together with harrow-root’ (Turner, 1884: 119).

Detailed descriptions of specially made funeral clothes are available for Eastern Siberia. According to Waldemar Jochelson (1908: 104–14, 587–607), who conducted field studies among the Reindeer and Maritime Koryaks of the Kamchatka Province during the winter of 1900/1901, the funeral garment (Fig. 3.3) is usually sewn in advance, a task done in secret by a close female relative; if the deceased is a married man, it is done by his wife. A man’s funeral coat, for example, is made of



**Fig. 3.3** Koryak funerary garments and cremations. 1–8: man's coat (front and back), trousers, belt, arrows, bow case, quivers, shoe, mitten, and cap; 9–11: woman's suit, overcoat, and boot, 12: child's cap, 13: cremation of a child, 14: funeral pyre with corpse (Jochelson, 1908: Figs. 43–53, 55 and pl. XIII)

white fawn skin<sup>8</sup> and covered with embroidery, whereas a woman's coat is made of brown-dyed reindeer skin with the hair side inwards and less elaborate embroidery (Jochelson, 1908: 105). Funeral garments are never fully completed in advance, because it is believed that the person for whom they are intended may soon die as a result. Unfinished parts may include the edge of the hood, the soles of the boots, or the buckles. The completion of the garb is a collective female endeavour and done in the home of the deceased. If the garment can be finished quickly, the body is cremated on the day of death (Jochelson, 1908: 105–10). Koryak funeral clothing differs from the clothing of the living not only in the way it is made, but also in the way the deceased is clothed with it. The dead body wears the left mitten on the right hand and the cap is facing backward; additionally, the reindeer carrying the corpse to the funeral pyre is purposely harnessed incorrectly (Jochelson, 1908: 110). This custom has been attributed to the belief that in the afterlife all things are diametrically opposed to the world of the living (Vdovin & Volodin, 2003: 210).

<sup>8</sup>In contrast, everyday clothes are made of the skins of young reindeer.



Alexander King, who did field research among the Koryaks in the 1990s, reports that the knots on the clothes are always untied during cremation, so that the deceased 'is not bound or snagged in the journey to the afterworld' (King, 1999: 60). In one instance, the clothes flew up during the cremation and exposed the naked corpse. This was deemed unlucky for the deceased, and a sign that the deer from which the deceased's clothes were made may not have belonged to him. The culprit was immediately identified as the deceased's ex-wife, who had sewn the clothes but had a bad reputation in the community (King, 1999: 60). According to Waldemar Bogoras, among the northern neighbours of the Koryaks, the Chukchee, the dead can also be dressed in unused everyday clothes if funeral clothes are not available. To leave the body in its worn clothes, however, 'is considered a slight to the deceased' (Bogoras, 1907: 520). Usually, the worn-out clothes are cut to pieces and left in a heap near the dead body. The Chukchee believe that these will be picked up by evil desert spirits who mend them 'with the sinew of the corpse' and wear them (Bogoras, 1907: 294).

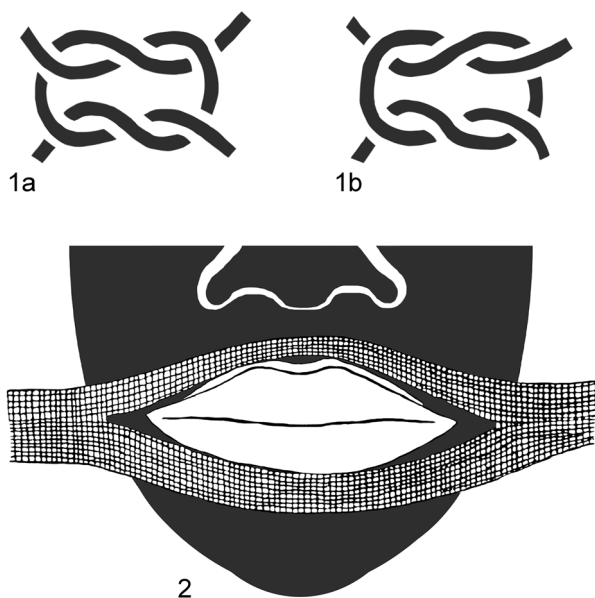
### 3.3 Fabrics and Beliefs

As has become apparent by now, ideology plays an important role in funeral rituals (cf. Carr, 1995: 188) and thus also influences the clothing of the deceased. The belief that the afterlife is a world inverted from the world of the living (a 'mundus inversus') has not only been reported from the Koryaks (see Sect. 3.2). A systematic search in the eHRAF database for evidence of textile use in connection with this belief yielded few results, with keyword searches proving difficult and an individual search of all 286 cultures for which specific funerary practices are noted (979 documents) not possible within the scope of this study. Therefore, only conjectures can be made at this stage about the actual extent of this belief and its regional distribution. The concept of an inverted world has been observed by Caroline Humphrey among the pastoralists of Mongolia in the area around Ulaanbaatar. At death, the naked corpse is wrapped in cloth 'up to the neck, as in swaddling', put on two white felts, and sewn up in a white cloth anti-clockwise, which is the opposite sewing direction from everyday Mongol sewing (Humphrey, 2002: 79). The practice of reversing the footwear by placing the left moccasin on the right foot and vice versa has been observed during Navajo funerals (Ward, 1978: 335).

Among the Mara in the Lushai Mountains of Mizoram, India, the 'ordinarily departed' spirits are destined for Athikhi, the village of the dead, which is opposite from the world of the living in some respects. For example, when it is day in the ordinary world, it is night in Athikhi, etc. (Parry, 1932: 395). On their way to Athikhi, the spirits of the dead meet the Chhongchhongpipa, a kind of Mara Cerberus, who shows them the way. Unfortunately, the Chhongchhongpipa also likes to steal the clothes of the dead. Thus, to prevent a deceased spirit from arriving naked in Athikhi, when a Mara dies, in addition to the shroud, a small piece of cloth

is placed under the armpit so that the Chhongchhongpipa can take it away (Parry, 1932: 396–97).

During his field work in the 1980s in the city of Hohhot (Inner Mongolia Autonomous Region, China), William Jankowiak found that it is strictly forbidden to dress the dead in a jacket made of animal skin,<sup>9</sup> because it is feared that it might cause the deceased to become an animal in the next life. The ideal materials for funerary jackets are silk, cotton, and wool (Jankowiak, 1993: 271). A concern that is similar in principle, but involves opposite fabrics, exists among the Quiché Maya of El Palmar, Guatemala. According to one of the informants of ethnographer Benson Saler, dressing the dead in silk or wool should be avoided, as ‘the person may go to the Inferno because wool is hot and silk is the industry of a worm that does not enter into the Glory’ (Saler, 1960: 102). Among the Navajo, knots play an important role in ceremonies. One of these knots (Fig. 3.4/1a) is used to tie a leather strap or rope around a dead body. It is different from general-purpose knots (Fig. 3.4/1b) and should never be used on a living person (Ashley, 1993: 220; Kluckhohn et al., 1971: 232) or be untied (Newcomb, 1940: 78). It is also noteworthy that knots have retained their importance in Navajo funeral rituals, although



**Fig. 3.4** Knots and straps: (1a): Navajo ‘knot of the dead’, known commonly as ‘granny knot’ or the ‘false’ knot; (1b): Navajo square knot used for general purposes (redrawn from Kluckhohn et al., 1971: 233, nos. 155.2 and 155.1, based on Ashley, 1993: 220, nos. 1206 and 1204); (2): death gag of the Dogon (redrawn from Dieterlen, 1941: 99, Fig. 6)

<sup>9</sup>For the Chukchee of Vayegi in the Anadyrsky District, Chukotka, Russia, this restriction also applies, but only to skins of wild animals (Kolomiets & Nuvano, 2020: 128).

funeral wrappings originally made of animal skins, and later of hand-woven native textiles, have been replaced by commercially manufactured blankets, and the traditional leather thongs have given way to ropes (Ward, 1978: 335).

Cornelius Osgood, who conducted fieldwork in a farming village on the Korean island of Kanghwa in 1947, reports that a man's unwashed corpse is dressed in his best clothes and with special paper shoes and, two days after death, is tied in seven places with hemp rope. The seven areas correlate with the seven stars of the Constellation of the Bear, considered an especially lucky constellation (Osgood, 1951: 116). For the nomadic Sarakatsani of Greece, it is reported that while married deceased individuals are dressed in their best outfit, unmarried persons wear a wedding costume,<sup>10</sup> for it is shameful to die unmarried. Funerals are considered as a marriage with the earth. After dressing, the deceased is laid on a white blanket in the middle of the hut until the time of final deposition, and the feet are tied together with a rope preventing the corpse from moving and becoming a revenant (Kavadias, 1965: 336).

A particularly interesting object related to the idea of the 'speech of the dead' was used by the Dogon in the Mopti region of Mali. After the relatives of the deceased have shaved the head, washed the body, and rubbed it with shea butter, they close all natural body orifices with cotton (Palau Martí, 1957: 43)—the earthenware jar that contains the butter is left at the entrance of the burial ground together with the calabash that holds the hair (Paulme, 1940: 499). Then, they slip a strip of white cloth between the legs and fasten it with a second strip that runs around the waist and serves as a belt; afterwards a bandage is attached to the back of the head and passed forward over the mouth area (Palau Martí, 1957: 43). This strap has an elongated opening in the middle (Fig. 3.4/2) and serves as a gag to contain the deceased's speech, which can sicken those nearby (Calame-Griaule, 1986: 529). After the gag is placed, the dead person is then dressed in his or her best clothes (Paulme, 1940: 499) and the body is wrapped in a woven linen blanket, tied shut at the top with a cord like a sack (Dieterlen, 1941: 98–99; Palau Martí, 1957: 43–44). Before the final disposal of the body—usually in a rock shelter or cave in a cliff—both the mortuary blanket and the gag are removed from the body. The blanket, which belongs to the whole family, is returned to the family home, where it serves as a substitute for the body for the rest of the funeral period (Paulme, 1940: 513–14). It is used again when the next family member dies (Dieterlen, 1941: 99). The removal of the gag is believed to free the dead person's speech (Calame-Griaule, 1986: 529). It is rolled up and placed in a hole between some stones at the entrance of the burial site (Calame-Griaule, 1986: 549, n. 83). In earlier times, the gag was a powerful and feared textile that played an important role in the so-called 'drinking the gag of a dead person', during which the truthfulness of a subject was tested. For this purpose, the gag was fetched from the cemetery, soaked in water, and drunk. If somebody that had taken an oath was dishonest, death was the consequence

<sup>10</sup>The idea that unmarried people must enter marriage at death was widespread in Europe. Especially in German-speaking countries, until about 100 years ago, both unmarried men and women were buried with a funeral wreath or crown (e.g. Lippok, 2009; Schmuhl, 2015).

(Calame-Griaule, 1986: 519–21; Dieterlen, 1941: 99). A creditor, for example, who claimed to the heir that the deceased still owed him something had to drink the dead man's gag. If he had lied, the liquid was expected to kill him within three years. If he stayed alive, the debt was paid (Paulme, 1940: 347–48).

### 3.4 Naked Dead Bodies

That the dead are always buried clothed or covered with some sort of fabric is usually taken for granted, for the idea of burying a corpse naked and without a protective cover seems repulsive in many societies (as the examples of the Koryaks and Mara show). In order to put this assumption to a cross-cultural test, the eHRAF World Cultures database was searched for evidence of deposition of naked dead bodies using the search terms 'naked', 'nakedness', 'nude', and 'nudity'. The initial search revealed 19 cultures, but on closer examination, five could be eliminated, as these alleged naked bodies turned out to be covered with an ox hide, a sheet, a blanket, a string with beads, and leaves. The Chukchee of Siberia (Bogoras, 1907: 527–28) and the Mongols of the Ordos Desert (Kler, 1936: 31) were also excluded, because they lay out the dead naked to be consumed by wild animals and birds of prey. Of the remaining 12 societies, in nine (or possibly even 10 cases<sup>11</sup>) nakedness in death is associated with very special categories of dead people. These are young children who have not yet reached the status of full members of society (Fellahin, Upper Egypt; Southwest Saramaka, Suriname; Hopi, US) (Blackman, 1927: 101; Price, 1990: 157; Titiev, 1944: 195); a woman and baby who died during childbirth (Fon, Benin) (Herskovits, 1967: 400); suicides (Mossi, Burkina Faso; Mataco, Argentina) (Mangin, 1914: 728; Métraux, 1943: 201–02); people who died violent deaths as a result of murder or punishment (Ifugao, Philippines; Igbo, south-eastern Nigeria) (Barton, 1930: 229–30; Meek, 1970: 43); and clan chiefs of the Gond ('Bison Horn Maria', Bastar State, India), who in the past were 'buried naked and in an upright posture' (Elwin, 1943: 23). In only two cultures of the eHRAF World Cultures database is it customary to lay a naked body to rest as part of a normative burial ritual, and not even in these two cases does it apply to all members of society. Among the Orokaiva of the Northern District, Papua New Guinea, a male corpse is entirely naked; a woman wears a perineal band (Williams, 1930: 211). Among the Luo in South Kavirondo, Kenya, 'every person, whether man, woman or child, is buried absolutely naked, and without any ornaments' except for the *jabilo*, a special type of healer with a secret medicine, who is considered 'the greatest among men'. He is buried in the fresh skin of a sacrificed bull (Hartmann, 1928: 273). From this it can be concluded that corpses are rarely laid to rest naked, unless the dead are not

<sup>11</sup> Rafael Karsten observed an old man being buried naked in a Toba village in the Chaco region of South America (Karsten, 1932: 192–93). I cannot determine whether this is a common custom among the Toba, due to the man's old age or another factor that may have contributed to his treatment.

full members of society or have suffered certain types of death (Weiss-Krejci et al., 2022: 11). It also supports Peter Wild's statement that 'burial of naked bodies can be regarded as a deliberate ritual act' (Wild, 2012: 17).

### 3.5 The Mourners

After death, social life is interrupted for the bereaved, as there is often a socially recognized right or requirement to mourn. Like the body of the deceased, the bodies of the bereaved are also undergoing changes during this time. The most common cross-cultural expressions of mourning are food and sexual taboos, self-inflicted violence, neglect of physical appearance, shaving the hair on the head, growing hair, body painting, nakedness, and the wearing of distinctive attire (Leach, 1958; Metcalf & Huntington, 1991: 43–61; Rosenblatt et al., 1976, 2011; Stubbe, 1986: 239–42; Turner, 1967: 93–111). Mourning can last from days to decades, but whether the funeral period is long or even observed varies from society to society. Mourning rites are further determined by the survivors' relationship to the deceased, and the dead person's vertical and horizontal social status.

Mourning attire usually contrasts with everyday clothing. In the traditional Chinese funeral ritual, for example, the colour white is 'a clear symbol of mourning' (Watson, 1988: 12). Colour, however, is not the only contributing element. Evidently, the type and texture of the mourning attire helps to distinguish kin distance and generations. In Hohhot, Jankowiak observed that the '[s]ons, daughters, daughters-in-law, patrilateral nephews and nieces, and nieces-in-law' (Jankowiak, 1993: 276) wear white short pants, shoes, and a hat with a small piece of flax sewn onto its front, whereas patrilineal grandchildren, although their mourning garment is similar, never wear flax. The wife of a deceased man wears a non-flax white hat but does not accompany the coffin to the graveyard (Jankowiak, 1993: 278), and the senior generation does not wear white at all, 'nor do they actively participate in the mourning rituals' (Jankowiak, 1993: 276). Especially noteworthy is the mourning symbolism of flax, which Jankowiak describes as 'the essence of mourning, expressing sorrow and a complete abnegation of personal comfort' (Jankowiak, 1993: 277).

The use of coarse 'uncomfortable' mourning attire made from cellulose fibres, such as flax and hemp, is not restricted to China. In Korea the yellow (formerly white) mourning garment is made of flax (Morse, 1897: 7) or hemp (Osgood, 1951: 119; Yi, 1975: 228), and in Vietnam, mourning clothes are made of linen or white cotton, but the closer a relative is to the deceased, the coarser the material has to be. Unlike the foreign cotton fabrics, these fabrics are of indigenous manufacture (Landes, 1882: 256). The types of cloth transform into metaphors of kinship. Sino-Annamese legislation even divides mourning kinsfolk into those wearing tailored, hemmed, coarse, fine, or silken hemp clothing (Tran-van-Trai, 1942: 62). Before the custom was suppressed following the year 1954, all close relatives used to wear mourning clothes with white turbans and skirts made of coarse flax or linen. The

colours for the turbans symbolize ‘the relative kin distance to the deceased’ (Kleinen, 1999: 180–81).

These examples point not only to the peculiar role of colour and texture for the mourners, but also to the global change in textile traditions through industrial production and international politics and markets (cf. Küchler & Were, 2005; Schneider, 1987: 433–36). The Chinese rites are but a shadow of a once much more complex and elaborate funerary tradition, a change that was effectuated in Inner Mongolia with the establishment of the Autonomous Region in 1949 (Jankowiak, 1993: 276). Such changes in funerary textiles, as well as textile traditions in general, instigated by governments, missionaries, and neighbouring dominant ethnic groups, are a recurring theme in the eHRAF sources (e.g. the Azande in the Sueh valley of Sudan; the Mongo of the upper Congo River) (Evans-Pritchard, 1971: 84; Nelson, 1994: 146–47).

For the bereaved, it is not only certain items of clothing that play a role, but also temporary nakedness, which Ernest Crawley describes as ‘the most violent negation possible of the clothed state’ (Crawley, 1931: 111–12). For 13 eHRAF cultures, it is reported that after the death of a person, survivors strip off their clothes and go stark naked or almost naked for some time. In the case of the death of a spouse it is usually the surviving spouse that removes his or her clothing, as for example among the Kimam of Yos Sudarso Island, South Papua, Indonesia (Serpenti, 1965: 192). Nakedness is also sometimes observed by siblings (Azande, Central Africa) (Baxter & Butt, 1953: 77) or by the larger kin group (Chipewyans of the Central Canadian Subarctic) (Hearne, 1958: 218–19). Among the Terena of the Southern Mato Grosso, Brazil, close female relatives of a dead man remove their clothing and cut their hair. For the duration of a month after death, they ‘wail at sunrise and sunset, sitting naked in their houses’ (Oberg, 1949: [40B]). Among the Ingalik of Alaska, when a boy dies ‘his father tears off his upper garments [...] and throws himself naked into the snow if it is winter; and, if summer, he rushes into the water [...]’. The mother, sister, brother, or wife also rend their clothing, tear their hair, and roll in the snow or rush into the water’ (Nelson, 1978: 30). If the dead person is a chief or a ruler, not only close and distant kin but the whole society is affected, as for example, at the death of a Hawaiian king, with everyone tearing their clothes and ‘going about naked and dishevelled’ (Sahlins, 1992: 69).

Wearing special clothes or being naked is not only a characteristic of mourners but also of ritual specialists who take on special roles during the funeral. Those in charge of the cremation of the Aztec ruler Tizoc in 1486 CE, for example, appear to have been naked (Durán, 1964: 180). In summary, although there are significant differences in the colour, texture, and type of mourning garments at both global and regional levels, designs and materials are never chosen arbitrarily, but always have a specific meaning.

As already noted in the introduction, textile gift exchange between individuals and groups also plays an important role in funerary rites, and is the subject of several ethnographic studies (e.g. Weiner, 1976: 115). I will only mention two examples. Among the Nyakyusa of southern Tanzania—their villages are not based on the principle of kinship but on age (i.e. villages consist of groups of males of the

same age group and their wives and children)—female neighbours and relatives bring gifts of bark-cloth belts with which to bind up the bellies of their bereaved friends. These belts signify their support and sympathy. Cloth made from other materials and used ‘to wrap the corpse and bind up the bellies of the chief mourners’ is provided by relatives and friends from other chiefdoms (Wilson, 1951: 72). Among the already-mentioned Kazakhs, the person who washes the body also receives the clothing of the deceased. In the past, the handing over of the clothes took place on the feast of the seventh day, the first in a series of commemorative feasts that also were held on the 40th day, the 100th day, and on the death anniversary (Grodekov, 1889: 257).

### 3.6 Textiles and the Disposal of the Corpse

Textiles can be used to stabilize or cover the body, to wrap the grave goods, or as decoration in and on the grave when the body and grave goods are deposited. Whether disposal of the body is a rite of separation or reintegration depends on the stage in which it takes place during the funerary cycle.<sup>12</sup> A sobering outcome of this study is that during deposition in a grave, especially when it is a rite of reintegration, textiles that play a role in the initial preparation of the corpse are often damaged, stored away, exchanged for new ones, deposited in separate places (e.g. the Dogon funeral blanket and mouth gag discussed in Sect. 3.3), or entirely destroyed. In 1909, the missionary and ethnographer Henri-Alexandre Junod witnessed a Tsonga interment in Rikatla, Mozambique, during which the blanket in which the body had been wrapped was removed from the corpse and cut in half with a knife. The same was done with the mat, on which the deceased liked to sit, and with his personal clothes. The explanation for cutting them up is that these objects, like the deceased, have to take their last breath (Junod, 1910: 960–61, 1912: 138–40). While the rug, mat, and used clothes have to die with the deceased and are placed in the grave, other personal belongings that still have some practical value (e.g. baskets) are hung up or placed at the foot of a tree near the grave or in front of the little hut that is built on the grave (Junod, 1912: 140–41). Among the Chukchee, who practice both cremation and exposure to wild animals, the freshly dressed corpse is carried out of the tent through the roof, placed on a sledge, and taken away from the settlement. Then, the dead person’s clothing is cut off the body, and the corpse disembowelled to determine the cause of death. Finally, the throat is cut to free the soul and prevent the deceased from following the living home (Bogoras, 1907: 525–28). When cremation is intended, the corpse is not disembowelled (only the throat is cut) and the clothes are left on the corpse (Bogoras, 1907: 532).

---

<sup>12</sup> If the final deposition of the body takes place at an early stage, the obligations of the mourners towards the deceased are often not yet over.



Textiles may also be added or replaced several times during the funeral period. According to Edward William Nelson, who travelled to Anvik, Alaska by sledge in the winter of 1880, a deceased Anvik Ingalik is usually dressed in new clothes and placed on the floor of the house. Two days later, the body is wrapped in grass mats, tied with rawhide cords, and taken to the cemetery on the opposite bank of the Anvik River. If the deceased is a revered person, a scaffold is erected outside the village where the body stays for a month. After this period, the mats are removed and the body is placed in a box on a caribou skin. The coffin is inserted into a larger wooden grave box that rests on four posts. A year after the death of the person, relatives open the coffin to see if the clothes are still in good condition. If the clothing has decayed, the body is redressed. Nelson also observed that in the cemetery, human figures stand on posts in front of the grave boxes to represent the dead. These figures are given new clothes and food offerings at the annual feast for the dead, which takes place every December. This is not the end of the matter, however; the Ingalik also hold final funerary festivals at ten-year intervals. In the summer before such a feast, new clothes are placed in the grave boxes of those deceased for whom the feast is held (Nelson, 1978: 28–30).

In the case of exhumation from a temporary grave and subsequent reburial—when it serves as a rite of reintegration and coincides with the final stage of mourning—the bones of the dead are usually cleaned, enveloped in new textiles, and deposited again in a separate location. Alternatively, they can be further processed and made into objects. In the Andaman Islands, when children or adults die, their bodies are tightly flexed and enwrapped in large leaves. Then they are buried in a sitting position for the remainder of the mourning period. Infants are buried in the camp; adults are brought to the jungle. At the end of mourning, the bones are exhumed and cleaned in the sea or in a creek. By then the original wrapping and the cords and cane strips used to tie the corpse have decayed. After taking possession of the cranium, jaw, and the postcranial bones, the relatives of the deceased manufacture them into various types of necklaces (Man, 1932: 73–77, pls. D/44, E/45–46) made from twisted leaf or bark cords and rubbed with red ochre (cf. British Museum collection As1886,1129.84.b, As1886,1129.85.b). Edward Horace Man, whose observations date from the period between 1869 and 1880 writes: ‘No adult is without at least one’ and ‘the skulls, which are generally to be found in every encampment, are worn by each in turn, if only for a few hours’ (Man, 1932: 78).

### 3.7 Discussion and Conclusions

The objective of this study was to analyse the variation and function of textiles and skins in funerary contexts, using information from ethnographic studies from around the world contained in the eHRAF World Cultures database. This paper not only serves as an introduction for those who wish to better understand the role of textiles in funerary contexts, but also sheds light on some important issues in interpreting the significance of archaeological textile finds from funerary contexts. After

all, the remains of fabrics found in graves are considered an important source for the general understanding of prehistoric textiles. As the examples in this paper show, the use of funerary textiles is shaped not only by the nature of subsistence, environmental conditions, technology, and socio-economic relations, but also by intra-societal ideas about how the dead should be treated according to gender, age, status, and identity. The chapter also stresses the importance of understanding how death was conceptualized in ancient societies (Wiseman et al., 2021), and how the realm of the living and that of the dead were differentiated (Veit, 1988: 166). Societal ideas about the afterlife, such as that of the *mundus inversus*, have a great influence on the way the corpse is dressed. The idea that certain funeral customs are related to the concept of inversion was already proposed by Lucien Lévy-Bruhl (1927: 385–86) and Hannes Stubbe (1988), among others. It was further discussed by Ulrich Veit (1988), using the example of the swapped shoes in the Iron Age princely tomb at Eberdingen-Hochdorf, and more recently by Rob Wiseman, Michael Allen, and Catriona Gibson for British Bronze Age barrows (Wiseman et al., 2021).

This study also shows that the preparation and dressing of a corpse, as well as mourning, while not universal, are quite common. In addition, commonalities across regions have been noted in relation to the practice of naked burial, as it is often associated with the burial of certain groups of the dead who do not conform to the norm, such as suicides, mothers who have died in childbirth, people who have died violently, and the very young. As for the question of naked burial, however, it should not be forgotten that many a group, especially hunter-gatherers of warmer climates, once wore clothing only intermittently or usually not at all (Gilligan, 2019: 12). This means that naked regular burial may also have been much more widespread in the past than this study suggests. With the onset of colonialism, a change in dress took place that may also have affected the funerary practices disapproved of by the colonisers.

Another finding of this study, namely that it is not advisable to infer the everyday dress of a prehistoric population from funeral garb, is by no means new, but cannot be stressed enough. To quote Barbara Jones from her seminal book *Design for Death*: ‘The bereaved as well as the corpses have often worn special clothes [...] often different from ordinary ones in design, cloth, or colour’ (Jones, 1967: 62). This study illustrates that whether the dead wear their everyday clothes, their best clothes, or their funeral clothes is society-specific. Mourning attire, on the other hand, is usually different or the opposite of everyday dress, as normality is suspended during mourning. What mourners wear, for how long, and for whom is governed by conventions that reflect the economic status and kinship of the bereaved. In some parts of the world, mourning clothes are deliberately made of scratchy materials to cause maximum discomfort, and sometimes mourners even go naked. Although mourning dress is not expected to be found in graves, scenes on pottery and other objects (e.g. Shapiro, 1991), as well as ancient historical sources, are our best chance of learning what people might have worn during mourning rites in the past.

There has been a growing realization among archaeologists that the term ‘funerary textiles’ implies much more than just the clothing worn by the deceased

(Banck-Burgess, 1999: 130; Yvanez, 2016). The eHRAF provide numerous examples of the variability and nature of textiles in tombs as wrappings for grave goods, textile containers, and fittings for burial chambers. Yet, funerary textiles are also involved in rites that take place beyond the grave. Not surprisingly, textiles that play a central role in life cycle rites are often used at only one point in the ritual before being discarded, destroyed, stored, or replaced with new ones. This is especially to be expected when the burial is temporary, followed by exhumation and reburial, or when the funeral period is exceptionally long, lasting many years or even decades.

Gaining a holistic understanding of the meaning of textiles and skins in a prehistoric setting is an incredibly difficult and multi-layered undertaking. Ethnographic data cannot provide answers to specific questions, but they can give ‘examples of the relationships between an activity and the tangible signs it creates’ (Boulestin & Duda, 2006: 152). There are many avenues for further investigation. Apart from consulting ethnographic sources (for example, Weiner & Schneider, 1989), archaeologists must continue to search for these materials in both burial and non-burial contexts, using state-of-the-art methods. Only through a large number of finds from funeral and non-funeral contexts will it be possible to distinguish regional everyday ‘cloth cultures’ (Harris et al., 2008) from funerary ones. The present study has shown that in many parts of the world, objects made of plant and animal fibres play a central role in all phases of the funerary cycle. Their use in the context of regular funeral rituals can therefore almost always be presumed, even if they are not to be regarded as an accurate reflection of the world of the living.

**Acknowledgements** I would like to express my sincere thanks to the two anonymous reviewers for their extremely helpful comments. My heartfelt thanks also go to Reinhold Mittersakschmüller for the photograph of the Batak funeral and the accompanying information, and to the editors Elsa Yvanez and Magdalena Wozniak for inviting me to participate in this book and for their great patience.

## References

- Anderson Strand, E., Mannering, U., & Nosch, M. L. (2022). Old textiles – New possibilities: Ten years on. In A. Ulanowska, K. Grömer, I. Vanden Berghe, & M. Öhrman (Eds.), *Ancient textile production from an interdisciplinary perspective. Interdisciplinary contributions to archaeology* (pp. 19–35). Springer.
- Ashley, C. W. (1993). *The Ashley book of knots. With amendments by Geoffrey Budworth*. Faber and Faber Limited.
- Banck-Burgess, J. (1999). *Hochdorf IV: Die Textilfunde aus dem späthallstattzeitlichen Fürstengrab von Eberdingen-Hochdorf (Kreis Ludwigsburg) und weitere Grabtextilien aus hallstatt- und latènezeitlichen Kulturgruppen*. Kommissionsverlag, Konrad Theiss Verlag.
- Barton, R. F. (1930). *The half-way sun: Life among the headhunters of the Philippines*. Brewer & Warren.
- Basso Rial, R. E., Jover Maestre, F. J., & López Padilla, J. A. (2021). An undervalued archaeological resource: Social aspects of Bronze Age textile production in the Eastern Iberian Peninsula. *European Journal of Archaeology*, 24, 324–344.

- Baxter, P. T. W., & Butt, A. (1953). *The Azande, and related peoples of the Anglo-Egyptian Sudan and Belgian Congo. Ethnographic survey of Africa, East Central Africa IX*. International African Institute.
- Blackman, W. S. (1927). *The Fellāhīn of upper Egypt: Their social and industrial life today with special reference to survivals from ancient times*. George G. Harrap & Company Ltd.
- Bogoras, W. (1907). *The Chukchee (part 2) – Religion. The Jesup North Pacific expedition VII. Memoir of the American Museum of Natural History XI*. E.J. Brill and G.E. Stechert.
- Bolohan, N., & Lazanu, C. C. (2018). Plant textiles in a grave mound of the Early Bronze Age in eastern Romania. In M. Siennicka, L. Rahmstorf, & A. Ulanowska (Eds.), *First textiles: The beginnings of textile manufacture in Europe and the Mediterranean. Ancient textiles series 32* (pp. 143–150). Oxbow Books.
- Boulestin, B., & Duday, H. (2006). Ethnology and archaeology of death: From the illusion of references to the use of a terminology. *Archaeologia Polona*, 44, 149–169.
- Calame-Griaule, G. (1986). *Words and the Dogon world*. Institute for the Study of Human Issues.
- Carr, C. (1995). Mortuary practices: Their social, philosophical-religious, circumstantial, and physical determinants. *Journal of Archaeological Method and Theory*, 2, 105–200.
- Cartron, I., & Zémour, A. (2022). Archaeothanatological approaches to associated remains in European funerary contexts: An overview. In C. J. Knüsel & E. M. J. Schotsmans (Eds.), *The Routledge handbook of archaeothanatology: Bioarchaeology of mortuary behaviour* (pp. 419–435). Routledge.
- Coon, C. S. (1931). *Tribes of the Rif*. *Harvard African Studies* 9. Peabody Museum of Harvard University.
- Crawley, E. (1931). *Dress, drinks, and drums: Further studies of savages and sex*. Methuen & Co. Ltd.
- Dempsey, J. (1955). *Mission on the Nile*. Burns & Oates.
- Dieterlen, G. (1941). *Les Âmes des Dogons*. *Travaux et mémoires de l'Institut d'ethnologie* 40. Institut d'ethnologie.
- Durán, D. (1964). *The Aztecs: The history of the indies of New Spain* (Translated from Spanish and with notes by Heyden D. Horcasitas F). Orion Press.
- Durkheim, É. (1912). *Les formes élémentaires de la vie religieuse: Le système totémique en Australie*. Les Presses universitaires de Franc.
- Elwin, V. (1943). *Maria murder and suicide*. Oxford University Press.
- Ember, M. (2000). *HRAF in the 21st century: Blueprint for the future after 50 years*. Human Relations Area Files.
- Ember, C. R. (2007). Using the HRAF collection of ethnography in conjunction with the standard cross-cultural sample and the ethnographic atlas. *Cross-Cultural Research*, 41(4), 396–427.
- Ember, C. R., McCarter, A., & Ringen, E. (2023). Uniformity in dress: A worldwide cross-cultural comparison. *Human Nature*, 34(3), 359–380.
- Evans-Pritchard, E. E. (1971). *The Azande: History and political institutions*. Clarendon Press.
- Garwood, P. (2011). Rites of passage. In T. Insoll (Ed.), *The Oxford handbook of the archaeology of ritual and religion* (pp. 261–284). Oxford University Press.
- Gilligan, I. (2019). *Climate, clothing, and agriculture in prehistory: Linking evidence, causes, and effects*. Cambridge University Press.
- Gittinger, M. (1990). *Splendid symbols: Textiles and tradition in Indonesia*. Oxford University Press.
- Grodekov, N. I. (Гродеков Н. И.). (1889). *Киргизы и каракиргизы Сыр-Дарьинской области (The Kazakhs and Kirgiz of the Syr-Darya Oblast)*. S.I. Lakhtin.
- Hardy, K. (2008). Prehistoric string theory: How twisted fibres helped to shape the world. *Antiquity*, 82(316), 271–280.
- Harris, S., Rösel-Mautendorfer, H., Grömer, K., & Reschreiter, H. (2008). Cloth cultures in prehistoric Europe: The Bronze Age evidence from Hallstatt. *Archaeology International*, 12(1), 22–26.
- Hartmann, H. (1928). Some customs of the Luwo (or Nilotic Kavirondo) living in South Kavirondo. *Anthropos*, 23, 263–275.

- Hearne, S. (1958). *A journey from prince of Wales's Fort in Hudson's Bay to the Northern Ocean, 1769, 1770, 1771, 1772*. The MacMillan Company Limited.
- Herskovits, M. J. (1967). *Dahomey, an Ancient West African Kingdom*. Northwestern University Press.
- Hertz, R. (1907). Contribution à une étude sur la représentation collective de la mort. *Année Sociologique*, 10, 48–137.
- Holmberg, A. R. (1950). *Nomads of the Long Bow: The Siriono of Eastern Bolivia*. Smithsonian Institution, Institute of Social Anthropology Publication 10. United States Government Printing Office.
- Humphrey, C. (2002). Rituals of death as a context for understanding personal property in socialist Mongolia. *Journal of the Royal Anthropological Institute*, 8, 65–87.
- James, E. (2022). A post-excavation study using the archaeoanthatological approach to determine the possibility of wrapping in Early Bronze Age burials of Britain. In A. Dickey, M. Gleba, S. Hitchens, & G. Longhitano (Eds.), *Exploring Ancient Textiles: Pushing the boundaries of established methodologies*. *Ancient Textiles Series 40* (pp. 111–121). Oxbow Books.
- Jankowiak, W. R. (1993). *Sex, death, and hierarchy in a Chinese City: An anthropological account*. Columbia University Press.
- Jochelson, W. (1908). *The Koryak: Religion and myths. The Jesup North Pacific expedition VI. Memoirs of the American Museum of Natural History X*. E.J. Brill and G.E. Stechert.
- Jones, B. (1967). *Design for death*. The Bobbs-Merrill Company.
- Junod, M. H. A. (1910). Deux enterrements à 20.000 ans d'intervalle. *Anthropos*, 5, 957–968.
- Junod, M. H. A. (1912). *The life of a South African tribe: I. The social life*. Attinger.
- Karsten, R. (1932). *Indian tribes of the Argentine and Bolivian Chaco: Ethnological studies*. *Societas Scientiarum Fennica, Commentationes Humanarum Literarum IV/1*. Akademische Buchhandlung.
- Kashirskaya, N., Kleshchenko, A., Mimokhod, R., & Borisov, A. (2020). Microbiological approach for identification of wool clothes in ancient burials. *Journal of Archaeological Science: Reports*, 31, 102296.
- Kavadias, G. B. (1965). *Pasteurs nomades méditerranéens: Les Saracatsans de Grèce*. Gauthier-Villars.
- King, A. D. (1999). Soul suckers: Vampiric shamans in northern Kamchatka, Russia. *Anthropology of Consciousness*, 10, 57–68.
- Kipp, R. S. (1979). The thread of three colors: The ideology of kinship in Karo Batak funerals. In E. M. Bruner & J. O. Becker (Eds.), *Art, ritual and Society in Indonesia* (pp. 62–95). Ohio University Center for International Studies.
- Kleinen, J. (1999). *Facing the future, reviving the past: A study of social change in a Northern Vietnamese Village*. Institute of Southeast Asian Studies.
- Kler, J. (1936). Sickness, death and burial among the Mongols of the Ordos Desert. *Primitive Man*, 9, 27–31.
- Kluckhohn, C., Wil, W. W., & Kluckhohn, L. W. (1971). *Navaho Material Culture*. Belknap Press of Harvard University Press.
- Knüsel, C. J., & Robb, J. (2016). Funerary taphonomy: An overview of goals and methods. *Journal of Archaeological Science: Reports*, 10, 655–673.
- Kolomiets, O. P., & Nuvano, V. N. (Коломиец, О. П., Нувано, В. Н.). (2020). Погребальные практики в современной чукотской культуре (Funerary practices in modern Chukchi culture). *Tomsk Journal of Linguistics and Anthropology*, 27, 126–136.
- Küchler, S., & Were, G. (Eds.). (2005). *The art of clothing: A Pacific experience*. Routledge.
- Landes, A. (1882). Notes sur le mœurs et les superstitions populaires des annamites (1). *Excursions et Reconnaissances*, 14, 250–269.
- Leach, E. (1958). Magical hair. *Journal of the Royal Anthropological Institute*, 88, 147–154.
- Lévy-Bruhl, L. (1927). *L'Ame primitive*. Félix Alcan.

- Li, L., Zhu, L., & Xie, Y. (2021). Proteomics analysis of the soil textile imprints from tomb M6043 of the Dahekou Cemetery site in Yicheng County, Shanxi Province, China. *Archaeological and Anthropological Sciences*, 13, 7.
- Lippok, J. (2009). *Corona Funebris: Neuzeitliche Totenkronen als Gegenstand der archäologischen Forschung. Beiträge zur Ur- und Frühgeschichte Mitteleuropas* 54. Beier & Beran.
- Lubis, J. R., Sandi, D. M., & Risaharti, R. (2020). Keberagaman jenis ulos dalam kajian visual digital di era milenial/The diversity of ulos types in digital visual studies in the millennial era. In *Prosiding Seminar Nasional Multidisiplin Ilmu Universitas Asahan ke-4 Tahun 2020 Tema: "Sinergi Hasil Penelitian Dalam Menghasilkan Inovasi Di Era Revolusi 4.0"* Kisanan, 19 September 2020 (pp. 152–168).
- Man, E. H. (1932). *On the aboriginal inhabitants of the Andaman Islands*. The Royal Anthropological Institute of Great Britain and Ireland.
- Mangin, E. (1914). Les Mossi. Essai sur les us et coutumes du peuple Mossi au Soudan Occidental. Livre Troisieme. *Vie active et industrielle. Anthropolos*, 9, 705–736.
- Marlowe, F. W. (2010). *The Hadza: Hunter-gatherers of Tanzania*. University of California Press.
- Meek, C. K. (1970). *Law and authority in a Nigerian Tribe: A study in indirect rule*. Barnes & Noble.
- Metcalf, P., & Huntington, R. (1991). *Celebrations of death: The anthropology of mortuary ritual*. Cambridge University Press.
- Métraux, A. (1943). Suicide among the Mataka of the Gran Chaco. *América Indígena*, 3, 199–209.
- Meyer, H. (1916). *Die Barundi: Eine völkerkundliche Studie aus Deutsch-Ostafrika*. Otto Spamer.
- Mitschke, S., & Paetz, A. (2012). Dressing the dead in the city of Rome: Burial customs according to textiles. In M. Carroll & J. P. Wild (Eds.), *Dressing the dead in classical antiquity* (pp. 115–133). Amberley Publishing.
- Morse, E. S. (1897). Korean interviews. *Appleton's Popular Science Monthly*, 51, 1–17.
- Nelson, E. W. (1978). Notes on Indians of the Yukon and Innoko Rivers. In J. W. VanStone (Ed.), *Nelson's Notes on the Indians of the Yukon and Innoko Rivers, Alaska. Fieldiana, Anthropology* 70 (pp. 17–61). Field Museum of Natural History.
- Nelson, S. H. (1994). *Colonialism in the Congo Basin, 1880–1940. Research in international studies, Africa series* 64. Ohio University Center for International Studies.
- Newcomb, F. J. (1940). *Navajo omens and taboos*. Rydal Press.
- Niessen, S. A. (1993). *Batak cloth and clothing: A dynamic Indonesian tradition*. Oxford University Press.
- Niessen, S. A. (2009). *Legacy in cloth: Batak textiles of Indonesia*. KITLV Press.
- Nilsson Stutz, L. (2015). A proper burial: Some thoughts on changes in mortuary ritual and how archaeology can begin to understand them. In J. R. Brandt, M. Prusac, & H. Roland (Eds.), *Death and changing rituals: Function and meaning in ancient funerary practices* (pp. 1–16). Oxbow.
- Nilsson Stutz, L., & Larson, L. (2016). Disturbing the dead: Archaeothanatological analysis of the Stone Age. *Journal of Archaeological Science: Reports*, 10, 715–724.
- Oberg, K. (1949). *The Terena and the Caduveo of Southern Mato Grosso, Brazil*. In *Smithsonian Institution, Institute of Anthropology, Publication* 9. United States Government Printing Office.
- Ogalde, J. P., Berke, H., Ogalde, C., Ma, Q., Min, L., & Arriaza, B. (2023). Archaeometric analysis of textile fiber dyes from the Topater-1 site, Calama, northern Chile, Middle Formative Period (ca. 400–200 BCE). *Journal of Archaeological Science: Reports*, 47, 103735.
- Osgood, C. (1951). *The Koreans and their culture*. The Ronald Press Company.
- Palau Martí, M. (1957). *Les Dogon. Monographies ethnologiques africaines*. Presses Universitaires de France.
- Parker Pearson, M. (2000). *The archaeology of death and burial*. Texas A&M University Press.
- Parry, N. E. (1932). *The Lakhers*. Macmillan.
- Paulme, D. (1940). *Organisation sociale des Dogon (Soudan français)*. University of Paris PhD Dissertation.

- Petrullo, V. (1939). *The Yaruros of the Capanaparo River, Venezuela*. Smithsonian Institution Bureau of American Ethnology Bulletin 123, Anthropological Papers 11. United States Government Printing Office.
- Price, R. (1990). *Alabi's world*. Johns Hopkins University Press.
- Robb, J. (2013). Creating death: An archaeology of dying. In S. Tarlow & L. Nilsson Stutz (Eds.), *The Oxford handbook of the archaeology of death and burial* (pp. 441–457). Oxford University Press.
- Rosenblatt, P. C., Walsh, R. P., & Jackson, D. A. (1976). *Grief and mourning in cross-cultural perspective*. Human Relations Area Files Press.
- Rosenblatt, P. C., Walsh, R. P., & Jackson, D. A. (2011). Grief and mourning codes. *World Cultures eJournal*, 18(2) <http://escholarship.org/uc/item/5cj4s1mq>. Accessed 19 Oct 2023
- Sahlins, M. (1992). *Historical ethnography: Anahulu: The anthropology of history in the kingdom of Hawaii, Vol. 1*. University of Chicago Press.
- Saler, B. (1960). *The Road from El Palmar: Change, Continuity, and Conservatism in a Quiché Community*. University of Pennsylvania PhD Dissertation. University Microfilms, Inc.
- Schmuhl, Y. (2015). Totenkranz, Totenkron. *RDK Labor*. <https://www.rdklabor.de/w/?oldid=88231>. Accessed 8 Dec 2022.
- Schneider, J. (1987). The anthropology of cloth. *Annual Review of Anthropology*, 16(1), 409–448.
- Serpenti, L. M. (1965). *Cultivators in the swamp: Social structure and horticulture in a New Guinea Society (Frederik-Hendrik Island, West New Guinea)*. Van Gorcum.
- Shapiro, H. A. (1991). The iconography of mourning in Athenian art. *American Journal of Archaeology*, 95(4), 629–656.
- Sibeth, A. (2012). *Gold, silver & brass: Jewellery of the Batak in Sumatra, Indonesia*. 5 Continents Editions.
- Siennicka, M. (2020). Craftspeople, craftsmanship and textile production in Early Bronze Age Greece. In L. Quillien & K. Sarri (Eds.), *Textile Workers: Skills, Labour and Status of Textile Craftspeople between the Prehistoric Aegean and the Ancient Near East: Proceedings of the Workshop held at 10th ICAANE in Vienna, April 2016*. *Oriental and European Archaeology* 13 (pp. 27–44). Austrian Academy of Sciences Press.
- Sinulingga, J., & Tampubolon, F. (2020). The meaning and symbols of the Batak Karo ethnic ritual ceremony: Study of semiotics. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*, 3(3), 2343–2348.
- Sørensen, T. F. (2017). The two cultures and a world apart: Archaeology and science at a new crossroads. *Norwegian Archaeological Review*, 50(2), 101–115.
- Stubbe, H. (1986). Prolegomena zu einer kulturanthropologischen Theorie der Trauer. *Curare Sonderband*, 4(1985), 237–255.
- Stubbe, H. (1988). Trauerverhalten und das Phänomen der verkehrten Welt. *Zeitschrift für Ethnologie*, 113, 199–205.
- Titiev, M. (1944). *Old Oraibi: A study of the Hopi Indians of Third Mesa*. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University 22, no. 1. Peabody Museum Press, Cambridge, MA.
- Tran-van-Trai. (1942). *The Annamese patriarchal family [La famille patriarcale annamite]* (Translated from the French for the HRAF files by C.A. Messner). P. L'apagesse.
- Turnbull, C. M. (1965). *The Mbuti Pygmies: An ethnographic survey*. *Anthropological Papers of the American Museum of Natural History* 50,3 (pp. 139–282). American Museum of Natural History.
- Turner, G. (1884). *Samoa, a hundred years ago and long before, together with notes on the cults and customs of twenty-three other Islands in the Pacific*. Macmillan.
- Turner, V. (1967). *The forest of symbols: Aspects of Ndembu Ritual*. Cornell University Press.
- Ulanowska, A., & Siennicka, M. (2018). The economics of textiles in Bronze Age Greece. In M. S. Busana, M. Gleba, F. Meo, & A. R. Tricomi (Eds.), *Textiles and dyes in the Mediterranean economy and society. Purpureae Vestes VI* (pp. 39–48). Libros Pórtico.



- Valentin, F., Rivoal, I., Thevenet, C., & Sellier, P. (Eds.). (2014). *La Chaîne opératoire: Funéraire: ethnologie et archéologie de la mort. Travaux de la MAE, René-Ginouvès 18*. Éditions de Boccard.
- Van der Kaay, H. J., & Ponsen, D. G. (2013). *Planters School Vereniging, Brastagi 1926–1942: Een andere kijk dan die van Rudy Kousbroek*. Free Musketeers.
- Van Gennep, A. (1909). *Les rites de passage*. Emile Nourry.
- Vdovin, I. C., & Volodin, A. P. (2003). Koryaks and Kerek. In P. Friedrich & N. Diamond (Eds.), *Encyclopedia of world cultures VI: Russia and Eurasia / China* (pp. 207–210). G.K. Hall.
- Veit, U. (1988). Des Fürstens neue Schuhe – Überlegungen zum Befund von Hochdorf. *Germania*, 66, 166–169.
- Ward, A. E. (1978). Navajo graves: Some preliminary considerations for recording and classifying Reservation burials. *American Indian Quarterly*, 4(4), 329–346.
- Watson, J. L. (1988). The structure of Chinese funerary rites: Elementary forms, ritual sequence, and the primacy of performance. In J. L. Watson & E. S. Rawski (Eds.), *Death ritual in late imperial and modern China* (pp. 3–19). University of California Press.
- Weiner, A. B. (1976). *Women of value, men of renown: New perspectives in Trobriand exchange*. University of Texas Press.
- Weiner, A. B., & Schneider, J. (Eds.). (1989). *Cloth and human experience*. Smithsonian Institution Press.
- Weiss-Krejci, E. (2011). The formation of mortuary deposits: Implications for understanding mortuary behavior of past populations. In S. C. Agarwal & B. Glencross (Eds.), *Social bioarchaeology. Blackwell studies in global archaeology 14* (pp. 68–106). Wiley-Blackwell.
- Weiss-Krejci, E. (2015). The distinction between funeral and burial and why it matters. In G. Delaplace & F. Valentin (Eds.), *Le Funéraire: Mémoire, protocoles, monuments. Colloques de la MAE, René-Ginouvès 11* (pp. 35–47). Éditions de Boccard.
- Weiss-Krejci, E., Becker, S., & Schwyzer, P. (2022). Interdisciplinary explorations of post-mortem interaction: An introduction. In E. Weiss-Krejci, S. Becker, & P. Schwyzer (Eds.), *Interdisciplinary explorations of postmortem interaction: Dead bodies, funerary objects, and burial spaces through texts and time* (pp. 1–21). Springer.
- White, C., Marin, M., & Fessler, D. M. T. (2017). Not just dead meat: An evolutionary account of corpse treatment in mortuary rituals. *Journal of Cognition and Culture*, 17, 146–168.
- Wild, P. (2012). The textile archaeology of Roman burials: Eyes wide shut. In M. Carroll & J. P. Wild (Eds.), *Dressing the dead in classical antiquity* (pp. 17–25). Amberley Publishing.
- Williams, F. E. (1930). *Orokaiva society*. Oxford University Press.
- Wilson, M. H. (1951). *Good company: A study of Nyakyusa age-villages*. Oxford University Press for the International African Institute.
- Wiseman, R., Allen, M., & Gibson, C. (2021). The inverted dead of Britain's Bronze Age barrows: A perspective from Conceptual Metaphor Theory. *Antiquity*, 95(381), 720–734.
- Yi, K. (1975). *Kinship system in Korea*. Human Relations Area Files.
- Yvanez, E. (2016). Textiles and funerary rituals: The wrapping of offerings at Meroe and el-Hobagi. *Sudan & Nubia Bulletin*, 20, 75–81.

**Estella Weiss-Krejci** is an archaeologist and social anthropologist (PhD, University of Vienna). The archaeology of death and burial is one of her research interests. She has received grants from the Austrian and Portuguese Science Funds, the Fulbright Commission, and HERA. She is currently Substitute Professor at the University of Heidelberg.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



**Part II**  
**Case Studies in Europe and the Nile**  
**Valley—Textiles on Bodies**

## Chapter 4

# Silk Textiles in Funerary Liturgical Garments in Poland (Seventeenth to Nineteenth Centuries)



Dawid Grupa 

**Abstract** Archaeological investigations carried out on church sites often lead to the discovery of buried crypts, containing the remains of several deceased. The favorable conditions within the crypts have allowed fragments of their clothing to be preserved. In many cases, representatives of the priesthood in their sepulchral vestments were also buried in these crypts. Their garments were either made especially for the occasion or were composed of chasubles that had already been damaged and were no longer in use at the time of the funeral. This is the case with the two chasubles from Piaseczno, one found in the crypt and the other still hanging in a wardrobe at the back of the church.

**Keywords** Crypt · Church · Silk · Chasuble · Textiles · Poland

## 4.1 Introduction

The purpose of this article is to present previously unpublished material from archaeological research carried out in the crypts of various parish churches in Poland. As this work is part of a larger research project, detailed laboratory research is still being carried out, together with a search for historical sources, the results of which will be presented in other publications.

## 4.2 Archaeological Research of Crypts

The archaeological study of crypts and tombs located under the floors of churches provides us with a great deal of information about the funerary culture of the early modern period, relating to the tombs of both lay and clerical representatives. In the

---

D. Grupa (✉)

Independent Researcher, Toruń, Poland

© The Author(s) 2025

E. Yvanez, M. M. Wozniak (eds.), *Funerary Textiles in Situ*, Interdisciplinary Contributions to Archaeology, [https://doi.org/10.1007/978-3-031-69461-5\\_4](https://doi.org/10.1007/978-3-031-69461-5_4)

case of the clergy, however, we have an almost 100 per cent certainty of finding silk fabrics in the form of chasubles, stoles, and maniples. The preservation of these textiles in graves depends on various factors that influence their condition, such as the soil environment, constant humidity, ventilation in the crypts, or the visits of burglars who robbed the graves, primarily looking for jewellery and metal objects to be sold or reworked (Grupa, 2012a, 103; 2018, 34–35; 2019, 189–198; Dudziński et al., 2013, 14). Research in the crypts of churches has shown that, for at least the last 300 years, there has been no access to them, but illegal human activities in their interiors have led to considerable destruction and the treatment of these spaces as garbage dumps. When the entrance was sealed, all kinds of rubbish entered through ventilation holes (Grupa, 2018, 34; 2019, 193–197; Dudziński et al., 2020, 245–248). The ingress of this material usually had the most destructive effect on the original arrangement of individual burials. Damage were also caused by the visits of animals, which entered the crypts by using the ventilation openings to get in and out. These animals often made their burrows inside the coffins, which caused skeletal fragments to be scattered around the coffins (Grupa et al., 2015, 15). Therefore, in many cases we can only assume that a particular cleric originally wore liturgical vestments made of silk.

Over the last two decades, the Toruń archaeological team from the Institute of Archaeology in Toruń, the Nicolaus Copernicus University in Poland,<sup>1</sup> has been conducting research in various churches throughout Poland, in some of which they have unearthed the burials of priests in various states of preservation. In earth graves, the position of the body was usually with the head facing east. In the case of crypts, this depended on the size of the crypt and its position within the plan of the church; in crypts located under corridors, it was often impossible to have the head facing east, as they were limited by earlier (lay) burials or by the size of the crypt. This situation is illustrated by the crypt in the church of St Nicholas and St Constance in Gniewkowo, where the spatial arrangement of the crypt (4 m along the north-south axis and 2.8 m along the east-west axis) made it impossible to place a coffin facing East-West. The entrance and the vestibule of the crypt were located under the aisles, positioned to the south (Majorek & Grupa, 2014, 95–97).

---

<sup>1</sup>Excavations have usually been related to church renovation plans, but because they were carried out during the continued functioning of these churches, the investigatory programmes had to be very carefully prepared so as not to disturb the liturgy nor create danger for its participants. That was only possible with the permission of parish priests and local congregations. In the particular situation when funerals had to be celebrated during the day working hours, parts of the investigative work was instead carried out during the night, in agreement with the Voivodeship Art Objects Restorer and the students. The working hours were further prolonged by the numerous burials requiring examination and the huge collection of deposited goods.

### 4.3 Silk in Liturgical Vestments

For centuries, clothing was a determinant of belonging to a particular social group (Grupa, 2005, 74; Prokop, 2013, 287). The liturgical garments referred to the holiness and dignity of the Son of God, the Pontifex Maximus, represented by the earthly priests (Nowowiejski, 1902, 1; Dudziński et al., 2017, 83). During the service, a priest appeared at the altar dressed in ceremonial vestments consisting of a chasuble, stole, maniple, and alb. The analysis of the available material has proved this to have been the case as early as the year 1000 CE, when it was recommended to make these liturgical vestments of silk<sup>2</sup> (Nowowiejski, 1902, 34–35; Dudziński et al., 2017, 118). However, the situation differed over time. The regulations of the Sacred Congregation of Rites clearly recommended that only silk fabrics should be used to make liturgical vestments, which were worn specifically during the service. However, preserved correspondence between the mendicant orders and the Congregation of Rites indicates the use of linen and woollen fabrics for the manufacture of chasubles, which was condemned by the highest ecclesiastical authorities. In response to these petitions, the bishop agreed to the use of these temporary woollen vestments until they were worn out, but demanded that new vestments be made from silk fabrics (Nowowiejski, 1902, 34–35; Dudziński et al., 2017, 118).

A similar attitude towards liturgical vestments was observed in the case of burial vestments, which were worn by deceased priests at their funerals, regardless of their position in the church hierarchy. This is confirmed by archaeological research carried out in Lublin, Gniew, Piaseczno, Warsaw, Gniewkowo, Lubiń, Toruń, Końskowola, and Szczuczyn (Grupa, 2010; Grupa et al., 2015; Dudziński et al., 2017, 2020; Nowosad et al., 2021). All excavated vestments were made of silk of varying quality and degree of use, worn during the lifetime of the deceased and before. The general recommendation of the Church authorities was to use vestments that were unusable for liturgical services. Hence the use of threadbare velvets (sometimes the pile on the surface has completely disappeared), garments with signs of patching (underlined), darned damasks, satins, samites, and other types. In many cases, the chasuble, stole, and maniple came from different sets, and if they had not been found together in the same coffin, it would not have been evident that they were part of the same funerary assemblage.

---

<sup>2</sup>In the beginning, liturgical vestments were made of linen or wool. Around the seventh/eighth centuries, following the example of Byzantine bishops, the import of silk started, first for bishops' chasubles, and later for common local priests as well. The colours of the vestments changed together with the kind of fabric. Initially, white, grey, and brown wool and linen were replaced by glittering shades of yellow and green silks imported from the Islamic and Byzantine world. This wide variety of silk colours was one of the reasons why an attempt was made to unify the colours of liturgical garments in the ninth/tenth centuries. Silk chasubles were also additionally decorated; e.g., in the eleventh century they were decorated with forked golden bands, called *aurifrisium*, which—excepting their decorative purpose—also had the function of covering seams (Nowowiejski, 1902, 34–35). This fact is demonstrated by the grave garments of St. Willigis (died in 1011) and St. Benon (died in 1088) (Nowowiejski, 1902, 232; Dudziński et al., 2017, 84).

The most common obstacles were encountered when analysing fragments from ossuaries found in crypts. The first difficulty was to fit all the elements together, e.g. chasuble columns, and to identify the pieces as fragments of liturgical vestments. The second was to assemble all the elements of stoles and maniples, and use these to estimate how many priests could have been buried in a particular ossuary, based only on complete sets of vestments. The results are, to some extent, reliant on guesswork. For example, in the ossuary located in the southern crypt of the church of St Nicholas in Gniew, three chasubles were reassembled from fragments (one of damask, two of worn velvet); two velvet stoles were immediately assigned as belonging with the velvet chasubles, but the damask stole did not match the damask chasuble at all, as the ornaments were completely different in composition and size. On the damask chasuble, a complete pattern repeat was 120 cm long (Fig. 4.1), whereas on the stole, the pattern consisted of small fragments about 2 cm long (Grupa, 2015, 194–198; Grupa et al., 2015, 109–112). Initially it was assumed that they belonged to two different sets, but later tests indicated that they could have been parts of one complete set.

Similar problems arose during the analysis of textiles excavated in a crypt under the presbytery of the Church of the Nativity of the Blessed Virgin Mary in Piaseczno (Pomorskie Province).<sup>3</sup> The arrangement of the textile fragments led us to believe that the ossuary was the burial place of at least six priests. The fabrics used to make the vestments included damasks with complex patterns, thick upholstery fabrics with multiple floral ornaments, and velvet. Our interest was piqued by a fragment of a chasuble column resembling the chasuble textile kept in the historical collection of the church sacristy—with, of course, altered colours due to the ageing process that has been taking place for at least 250 years (Fig. 4.2). The textile was woven using the *point rentré* technique, which dominated the silk market in the seventeenth century. The chasubles may have been made from textiles donated to the Marian Sanctuary, which were originally used as women's dresses. Fabrics used for eighteenth-century dresses were so large that there was enough material for two sets of liturgical vestments. Closer examination of the chasuble from the sacristy and the artefacts found in the crypt revealed numerous patches and repairs. The fact that the vestments were sewn from pieces of silk is confirmed by a letter from the Rector of the Piarist Order in Szczuczyna to Konstancja Potocka Szczuczyna dated 1718, in which he asks if it is possible to make a chasuble from unidentified pieces of silk, as the others are very worn. The text informs us that there were probably old, worn clothing elements that were not good enough nor sufficient in quantity for a complete set of liturgical vestments (Dudziński et al., 2017, 92), which supports the hypothesis that they were originally used for other purposes (Dudziński et al., 2020, 250–251).

Similar difficulties with the completion of liturgical vestments were reported during the study of textiles from the crypt of the Church of the Discovery of the Holy Cross and St Andrew the Apostle in Końskowola (Lubelskie Province).

---

<sup>3</sup>The village is 6 km south of Gniew.



**Fig. 4.1** Gniew. Silk textile chart, attempt to reconstruct the original decorative scheme. (Drawing M. Grupa, digital processing T. Dudziński)



The northern crypt was built for the district governor Łukasz Opaliński, of the heraldic clan of Łódzia (died in 1662), and his wife Izabela of the Tęczyńskis (died in 1667). In the centre of the crypt, a stone sarcophagus with vivid images of death was built (Fig. 4.3). The visual form of the sarcophagus follows the fashionable trend of macabre images symbolizing death and decay. These messages were the basis of the idea of *vanitas* (Grupa & Grupa, 2015: 91–92; Nowosad et al., 2021, 29–30). Finds scattered all around, consisting of the remains of numerous coffins and silk textiles, ‘told’ us more about the history of the crypt. The first thing that caught the attention of the archaeologists and restorers was a red damask with a pattern repeat about 1 m in length of a floral motif, and a light fabric with colourful floral motifs and silver



**Fig. 4.2** Piaseczno. Historical chasuble with added fragment of discoloured textile from the grave chasuble from the crypt under the presbytery. (Photo D. Grupa)

metallic thread (Fig. 4.4). This combination should not be surprising, but in this case (after conservation and reconstruction), the red damask was found to date to the sixteenth/seventeenth century (just like the damask with repeat from Gniew, Fig. 4.1), while the light fabric with colourful flowers is dated to the eighteenth century (Fig. 4.5). If the pieces had been found separately, the researchers would have interpreted them as parts of earlier burials dated to the seventeenth century, but



**Fig. 4.3** Końskowola, northern crypt. *Vanitas*—perspective from western side, right hand resting on the hourglass. (Photo W. Nowosad)



**Fig. 4.4** Końskowola, northern crypt. Fragments of a chasuble made of red damask before conservation treatment. (Photo D. Grupa)





**Fig. 4.5** Końskowola, northern crypt. Reconstruction of chasuble made from red damask. (Photo D. Grupa)

the later cleaning of the crypt (removal of relics of the Teczyński and Opaliński families) prevented such early clothes from being found. It is certain that in the eighteenth century, or even at the end of the seventeenth century, new coffins containing the bodies of dead priests were placed around the sarcophagus. The number of laymen buried there cannot be estimated at the present stage of research, since most of the burials had been removed, and the associated artefacts that remained for analysis consisted only of pieces of ribbons, fragments of a silk burial garment (basted), silk stockings, and leather shoes (Nowosad et al., 2021, 43–49).

#### 4.4 Archaeological Finds of Liturgical Vestments

The attitude of researchers to the description and completion of liturgical vestments changed after the research in the crypts under the presbytery of the Church of the Name of the Holy Virgin in Szczuczyn, where interesting excavations of naturally

mummified burials of laymen and clergy were reported.<sup>4</sup> Thanks to the favourable conditions in the crypt, elements of clothing made not only of silk, but also of linen, wool, and cotton have been preserved, which enabled a fairly precise description of the burial clothes of laymen and clergy (Grupa, 2012a, 110–122; Dudziński et al., 2015, 80; 2017, 97–104; Grupa et al., 2014, 75–77).

The eastern crypt B in Szczuczyn contained 24 coffins with male remains belonging to the Order of the Piarists, the majority of which could be identified by their full names. However, the research team was mainly interested in the information contained in the inventory of monastic clothing, liturgical vestments, and linen underwear. As already mentioned, most of the analyses conducted so far has yielded only silk textiles (Grupa, 1998, 297–291; 2010, 91–96; 2015, 193–199; Grupa et al., 2015, 109–112). The Szczuczyn finds shed new light on burial garments, and the way in which burial liturgical garments were assembled has finally become clear. Except for the silks, nothing else in any of the burials was made according to the strict rules in place—the chasuble was made of one textile, the stole from another, and the maniple did not fit with either.<sup>5</sup> While studying this material, we clearly identified a number of repairs, such as patching holes with another type of silk, distinguishable because their long stitches had different thread colours (Fig. 4.6) (Dudziński et al., 2017, 55, 90–92; Grupa, 2019, 174–178). The most important and interesting elements of the textile collection related to the clergy burials in Szczuczyn are objects made of wild silk, which is deprived of the gloss typical for silk. Previously, this material has been called inferior or worse, but we can now be certain that it is indeed a form of silk: wild silk (Beuth, 1969, 37; Dudziński et al., 2017, 97). Based on visual analysis alone, this material can be misclassified as woollen or linen fabrics of plain weave 1/1, so-called tabby. However, analyses carried out by microscopic examination of individual fibres have confirmed that they are silk (wild silk). These fabrics are not glossy, which is typical for silk, but matte<sup>6</sup> (Dudziński et al., 2017, 97). This textile production must have been significantly developed and the products popular, as we found in Szczuczyn vestments from the first half of the eighteenth century and into the nineteenth century (Fig. 4.7).

---

<sup>4</sup>This natural mummification has occurred due to the dead bodies being subjected to dry warm air and air flow. The crypts were equipped with ventilation holes, some of which were unfortunately later bricked up. However, leaving the biggest opening free has preserved, at least partially, the mummified character of the deposited bodies (Kozłowski & Krajewska, 2013, 86).

<sup>5</sup>The chasuble and the maniple from coffin 7 were made from identical textiles, while the stole was different both in the scheme of ornamentation and colours. Big floral compositions from the chasuble (yellow and red) did not bear any resemblance at all to the small compositions on the stole (blue and brown). That set, as well as four others, confirm our earlier proposal that old garments were used for burial, as both items had been carefully mended, possibly more than once (Dudziński et al., 2017, 90–91).

<sup>6</sup>Until now, wild silk has been reported in archaeological materials only for trimmings and haberdashery products (Grupa & Grupa, 2013, 50–51; Grupa et al., 2014, 72, 131; 2015, 50–51), which is also remarked upon by Maria Bogucka when discussing the production of Gdańsk haberdashers (Bogucka, 1956, 114).



**Fig. 4.6** Szczuczyn. Detail of silk textiles from a maniple, showing its repairs. (Photo A. Wojciechowska)



**Fig. 4.7** Szczuczyn. The Piarist's burial in liturgical vestments made of wild silk. (Photo A. Wojciechowska)



**Fig. 4.8** Końskowola, crypt under the presbytery. Chasuble fragment with stripe motif after conservation. (Photo D. Grupa)

Typical liturgical vestments of the seventeenth and eighteenth centuries were generally made of silk imported from France, Italy, and Turkey. Large-patterned damasks (such as the chasuble from Gniew) were replaced by textiles with much smaller decorative patterns, including floral compositions with various additional ornaments—luxuriant flowers, arabesques, acanthus leaves, lace, and other floral-geometric compositions, as well as architectural elements (textile from Piaseczno in *point rentré* technique). They were often arranged in stripes (Fig. 4.8), sometimes in different colours (chasubles from Końskowola and Szczuczyn<sup>7</sup>). On many

<sup>7</sup>A chasuble from coffin no 8 (catalogue no 46) was made of eighteenth-century thin textile with striped ornament. The composition consisted of various thickness and colours of stripes; the effect was additionally strengthened by introducing a thread with silver metal braiding into the narrowest stripes. The full composition width, repeated across the full textile width, is only 11.5 cm. The same fabric was used to make a manipule from coffin no 9. Stripes were also reported on the textile used for the chasuble and manipule from coffin no 21, burial B. The floral ornament on this example is much more developed, with two differently coloured grounds—dark and bright (Dudziński et al., 2017, 100–101). The pattern's complete width is 7.6 cm. A similar composition of stripes occurred on the textile used for the chasuble reported from the crypt of the church of the Holy Cross Discovery and St. Andrew the Apostle in Końskowola (Grupa, 2010, 92–93, Fig. 10).



textiles, the common element was flowers embroidered in silk thread covered with metal, both gold and silver (chasuble from Piaseczno). Jean Revel's (1684–1751) designs included large floral compositions imitating tapestry arrangements. At that time, lay and liturgical vestments were made of the same type of fabric. Even the most expensive textiles, without any distinguishing elements of sacral symbolism, were made in such a way that it was difficult to isolate any special features of liturgical vestments (Żarnowiecki, 1915, 126), and if the arrangement of the grave goods did not indicate a clerical burial, it was difficult to interpret the find. Similar textiles were used to make various elements of liturgical vestments from Szczuczyn. The textile embellished with a dragon as a decorative motif was a great surprise. A dragon was a popular motif in Far Eastern decorative schemes, symbolizing strength and agility<sup>8</sup> (Dudziński et al., 2017, 52). However, this fact does not seem to have been of any importance when the chasuble was made. The eighteenth century was characterized by a fashion for the art of the Far East, and textile designers copied not only motifs from Chinese porcelain decorations,<sup>9</sup> but also the Buddhist cross gammadion, hexagram (i.e. honeycomb), crane, turtle shell, and all the elements associated with natural phenomena: clouds, flowing water, waves (Żarnowiecki, 1915, 97–98; Toussaint-Samat, 1998, 281).

Plain and patterned silk velvets have been used for liturgical vestments since the beginning of their production in Italy (Grupa & Grupa, 2013; Grupa et al., 2015, 78). In the case of textiles from clergy burials in Szczuczyn, mostly cut velvet in dark colours was used, e.g. grey velvet on the maniple with a clover-shaped ornament across the whole surface, which was visible just after the opening of coffin no. 6 in the east A crypt. Red haberdashery crosses (bands) sewn on the objects, made of trimmed velvet, stand out against the background of a light brown chasuble and a grey maniple (Dudziński et al., 2017, Fig. 82).

In Szczuczyn, archaeologists generally had no problems identifying velvet (Grupa, 2015, 193–199; Grupa et al., 2015, 110–111, Fig. 86). In other cases, the fluffiness of the pile and the shape of a pattern were more readable (this is particularly clear on the liturgical vestments of Bishop Jan Gniński, with the Trach coat of arms from Lubiń (Grupa, 1998, 277–280), and the maniple from Piaseczno (Fig. 4.9).<sup>10</sup>

Among the most expensive textiles used for the production of liturgical vestments are items with stylized floral patterns, made of thread with silver or gold braiding. The predominant element of the textile was the pattern, made with metal

<sup>8</sup>Dark blue satin textile with the motif of dragon paws in red-green used as an orphrey (burial from 1777).

<sup>9</sup>In Piaseczno, one of the stoles was made of a silk textile with a motif of a bonsai tree (Grupa, 2018, 36, 256).

<sup>10</sup>Geometrical pattern with regular quadrangles, shaped with loops.

**Fig. 4.9** Piaseczno, crypt under the presbytery. Velvet stole with geometrical pattern edged with short tassels. (Photo D. Grupa)



thread, while details added with silk thread of the same colour as the background subtly filled the remaining surface. Sometimes the ornamental framework was completed with colourful flowers made with the brocading technique, as well as with elements made with metal braided thread. Examples of such robes were excavated in Piaseczno (Fig. 4.10) and Szczuczyn (Dudziński et al., 2017; Grupa, 2018).

**Fig. 4.10** Piaseczno, crypt under the presbytery. Chasuble side column—damask with additional brocaded flower calyces formed with metal braiding thread. (Photo D. Grupa)



## 4.5 Fabric Decoration

Various haberdashery products and ribbons were integral parts of the chasuble, separating the orphreys from the side columns. They were also used to trim the edges, and appeared on stoles and maniples as well. They comprised ribbons about 1–2.2 cm wide, short tassels in two, three, or four colours, and bobbin laces made of thread with metal braiding in gold, silver, or copper alloys ('false' haberdashery). The latter usually decomposed relatively quickly, leaving green traces of corrosion products on the surface of the fabric (Grupa, 2010, 91, 93; Nowosad et al., 2021, 87–88).

The production of haberdashery in the Early Modern Period was very diverse, so it is difficult to determine the place of its origin by examining items from particular chasubles. It is known that the centres of haberdashery production in the area of modern-day Poland were concentrated in Gdańsk,<sup>11</sup> Kraków, Poznań, and Toruń. The development of the craft was reported at the end of the sixteenth century, when craftsmen from the Netherlands arrived in these cities (Grupa, 2012b, 147). They escaped from religious persecutions in their homeland, and brought with them new skills and technologies, but it is difficult to determine how much of the production was local and how much foreign. Analyses of grave material only confirm the fact that the same ribbons, trimmings, and tassels were used to decorate both lay and clerical clothing and vestments.

## 4.6 Conclusion

When studying the problems of silk textile circulation, we need to focus on two routes—Gdańsk, which was reached by Hanseatic ships and Dutch merchants, and the road from Turkey to Lvov, which was partly identical with the Viking trade route to Kyiv and Novgorod.<sup>12</sup> This route was generally used by Armenians who settled in Poland and set up factories and trading posts in Constantinople, Bursa, and other cities of the Ottoman Empire.

Despite various disasters and wars, silk has been brought to Poland since the early Middle Ages. As time went by, the quantities of this precious material reaching Poland increased from century to century, not always finding its first destination in churches. Instead, silks often found their second life in churches, being donated in the form of old *Żupans*,<sup>13</sup> *Delia* coats,<sup>14</sup> *kontushes*,<sup>15</sup> and women's dresses

---

<sup>11</sup> Gdańsk was one of main centres of so-called 'false' haberdashery manufacturing, which was successfully sold in European and Asian markets. Gdańsk's production was popularized by Venetian merchants, who traded its products all around the Mediterranean basin in the seventeenth and eighteenth centuries.

<sup>12</sup> For ease, the present author has chosen to use the most commonly accepted names of these cities in modern times, since many of them changed name several times during the studied period.

<sup>13</sup> The *Żupan* is a basic part of Polish men's clothing, worn alone or under a *kontush*, and made of wool, linen and silk fabrics. The top of the gown is fitted, from the waist it is loose. Sleeves are wide at the top, tapering from the elbow to a differently shaped cuff that falls on the hand or ends in a straight line at the wrist. The collar varies in height from a small, rounded collar to a spreading collar. The front is fastened with small metal or haberdashery buttons, usually 18 or more pieces. (after Grupa, 2022, 261).

<sup>14</sup> The *Delia* (also *delika*, *delura*, *delurka czagat*, *degle*) is a robe with wide sleeves, bipartite at the front. It is a men's garment, often lined with fur, worn in the 16th and the first half of the seventeenth century. Initially worn with the arms in the sleeves, it was later only thrown over the shoulders. The *delia* varied in length according to fashion, and the length of the collars also varied, falling as far as mid-back. The *delia* was first fastened with buttons, later with loops. The summer variant lacked fur (after Grupa, 2022, 252).

<sup>15</sup> The *Kontush* is a top kaftan in Polish clothing. It is characterised by the cut of the back, passing from the waistline into a long rectangle, or rather a trapezoid piece of fabric widening towards the bottom, called a pillar, to which the sides or triangular wedges were sewn from pieces of fabric of

(Grupa, 2019: 172–173). When examining the chasubles, it is not possible to find out which clothes were used to make them, because in most cases the same textiles were used to make men's, women's and children's clothes, as well as liturgical vestments. Sometimes they were patched together from many fragments, as can be seen, for example, in textiles from Gniew, Piaseczno, and Szczuczyn. Some vestment elements were made of old and badly damaged textiles, which can be seen in their repairs—darning (Fig. 4.6) and patching. These repairs were not visible when a dead priest was exposed on a catafalque, because the textile could be folded skillfully, covering all imperfections, and in the light of candles some elements would not have been visible at all. Each chasuble and manipule were lined with a galloon containing metallic threads of gold or silver colour, and these are the elements that would have been the most readable during the funeral ceremony in the light of the candles around the bier: 4, 6, or even 30 candles and not the darned holes. The whole burial was presented as rich and splendid, which was additionally guaranteed by the use of silk fabrics (Grupa, 2005, 35; Grupa et al., 2016 18–19; Dudziński et al., 2015, 77–81; Grupa & Łukaszewicz, 2019, 139–152).

## References

- Beuth, B. (1969). *Włókna w życiu codziennym*. Warsaw.
- Bogucka, M. (1956). *Gdańskie rzemiosło tekstylne od XVI do połowy XVII w.* Warsaw.
- Dudziński, T., Krajewska, M., & Grupa, M. (2013). Krypty kościoła p.w. Imienia NMP w Szczuczynie źródłem do badań historycznych. In T. Dudziński & M. Grupa (Eds.), *Tajemnice szczuczyńskich krypt 1* (pp. 9–20). Grajewo.
- Dudziński, T., Grupa, M., Grupa, D., Krajewska, M., Majorek, M., Nowak, M., Nowak, S., Przymorska-Sztuczka, M., & Wojciechowska, A. (2015). *Tajemnice szczuczyńskich krypt 3*. Grajewo–Toruń.
- Dudziński, T., Grupa, M., & Nowosad, W. (2017). *Tajemnice szczuczyńskich krypt 4*. Grajewo–Toruń.
- Dudziński, T., Grupa, D., Grupa, M., & Nowak, M. (2020). Badania w krypcie pod prezbiterium kościoła pw. Narodzenia Najświętszej Maryi Panny w Piasecznie, gm. Gniew, woj. pomorskie. *Raport*, 15, 243–255.
- Grupa, M. (1998). Textiles from the 16th–18th century from the benedictine in Lubiń, Leszno voivodeship. In L. Bender Jørgensen & C. Rinaldo (Eds.), *Textiles in European archaeology. Gotarc series A* (Vol. 1, pp. 277–281). Goteborg.
- Grupa, M. (2005). Ubiór mieszczan i szlachty z XVI—XVIII wieku z kościoła p.w. *Wniebowzięcia Najświętszej Marii Panny w Toruniu*. Toruń.
- Grupa, M. (2010). Liturgical vestments from Warsaw and Końskowola, from studies into ancient textiles and clothing. *Fasciculi Archaeologiae Historicae*, 23, 91–96.

---

different sizes. Sleeves (called outlets) were usually slit from the armpit to the elbow and rolled loosely along the limb or thrown over the back. The overcoats were lined with furs of various types with a large, lined fur collar or delicate stand-up collar. They were fastened from the waist with metal buttons or haberdashery buttons. The *kontush* became a symbol of Polish dress until the twentieth century (after Grupa, 2022, 256).

- Grupa, M. (2012a). Pochówki w krypcie grobowej kościoła p.w. Imienia NMP w Szczuczynie jako źródło do lokalnych badań kostiumologicznych. In T. Dudziński (Ed.), *Pozzaarchiwalne materiały źródłowe do dziejów powiatu szczuczynskiego w XIX wieku* (pp. 109–125). Grajewo.
- Grupa, M. (2012b). *Wielniane tekstylia pospólstwa i plebsu gdańskiego (XIV–XVII w.) i ich konserwacja*. Toruń.
- Grupa, D. (2015). Silk liturgical garments from priests' graves, excavated in St. Nicolas parish church in Gniew. In: *NESAT XII. The North European Symposium for Archaeological Textiles*, Hallstatt, Austria. Vol.: *ARCHAEOLINGUA* vol. 33, Budapest, pp. 193–199.
- Grupa, M. (2018). Kultura materialna w świetle badań archeologicznych w sanktuarium w Piasecznie. In W. Pikor (Ed.), *Kultura materialna i duchowa sanktuarium w Piasecznie* (pp. 33–43). Bernardinum.
- Grupa, M. (2019). Not only socks were darned – Secondary textile usage as a source of material culture studies. *Fasciculi Archaeologiae Historicae*, 32, 165–187.
- Grupa, M. (2022). *Czas żupanów, czas czechmanów. Strój polski w źródłach archeologicznych, ikonograficznych i pisanych*. Wydawnictwo naukowe UMK.
- Grupa, M., & Grupa, D. (2013). Wstążki, wstążeczki z krypt kościoła p.w. Imienia NMP w Szczuczynie. In T. Dudziński & M. Grupa (Eds.), *Tajemnice szczuczynskich krypt 1* (pp. 41–52). Grajewo.
- Grupa, D., & Grupa, M. (2015). Vanitas, z kręgu badań nad śmiercią i przemijaniem. *Pomorania Antiqua*, 24, 91–96.
- Grupa, M., & Łukaszewicz, J. W. (2019). Silk band and metal appliques of a child bonnet from the northern crypt of the parish church in Gniew. Jedwabna wstążka i metalowe aplikacje z dziecięcego czepka z krypty północnej kościoła parafialnego w Gniewie. *Annalecta Archaeologica Ressoviensia*, 14, 137–153.
- Grupa M, Grupa D, Kozłowski T, Krajewska M, Majorek M, Nowak M, Nowak S, Przymorska-Sztuczka M, Wojciechowska A, Dudziński T (2014) *Tajemnice szczuczynskich krypt 2*.
- Grupa, M., Kozłowski, T., Jankauskas, R., Grupa, D., Krajewska, M., Krakowska, S., Majorek, M., Mosiejczyk, J., Nowak, M., Nowak, S., Przymorska-Sztuczka, M., & Wojciechowska, A. (2015). *Secrets of the crypt in St. Ann chapel*. Tajemnice krypty w kaplicy św. Anny. Gniew.
- Grupa, D., Grupa, M., Kozłowski, T., Krajewska, M., Majorek, M., Nowak, M., & Wojciechowska, A. (2016). Badania w kościele pw. św. Mikołaja w Gniewie w latach 2009-2010. In M. Fudziński (Ed.), *I Pomorska Sesja Sprawozdawcza* (pp. 103–114). Gdańsk.
- Kozłowski, T., & Krajewska, M. (2013). Mumifikacja ciała ludzkiego – wstępne wyniki badań antropologicznych pochówków w kryptach kościoła p.w. Imienia NMP w Szczuczynie. In T. Dudziński & M. Grupa (Eds.), *Tajemnice szczuczynskich krypt 1* (pp. 83–98). Grajewo.
- Majorek, M., & Grupa, M. (2014). Kościół p.w. św. Konstancji i św. Mikołaja w Gniewkowie: w świetle badań archeologicznych. In T. Łaskiewiczza (Ed.), *Pamięć, tradycja, trwanie: szkice z dziejów Gniewkowa i okolic* (pp. 91–105). Polskie Towarzystwo Historyczne. Oddział w Inowrocławiu.
- Nowosad, W., Grupa, M., Kozłowski, T., Nalaskowski, F., Grupa, D., Kulesz, A., Openkowski, R., Dobek, M., Majorek, M., & Michalik, J. (2021). *W źródłach utrwalone – krypty w Końskowoli*. Końskowola–Łódź.
- Nowowiejski A (1902) *Wykład liturgii Kościoła Katolickiego* t. 2, cz. 1.
- Prokop, K. R. (2013). *Między ascezą a przepychem*. Warsaw.
- Toussaint-Samat, M. (1998). *Historia stroju*. Warsaw.
- Żarnowiecki, L. (1915). *Historia tkanin jedwabnych*. Kiev.

**Dawid Grupa** graduated in 2011 with a master's degree in archaeology, specialising in organic conservation and historical archaeology. He has collaborated for a longer period of time on projects related to research carried out on church sites in crypts and cemeteries.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.





# Chapter 5

## Research on Post-medieval Funerary Attire: Ethics, Challenges, and Successful Methods for Studying Coffin Textiles Found Below Finnish Church Floors



Sanna Lipkin

**Abstract** A collection of post-Medieval coffin burials is located below the wooden floors of several churches in northern Finland. This paper considers the ethics, challenges, and benefits of the chosen research methods on the burial textiles inside the coffins. As this chapter demonstrates, working conditions below the floors are challenging, but *in situ* documentation is possible. In addition, as demonstrated through an example from St. Michael's Church in Keminmaa, the aim is to provide a closer look at the possibilities and limits of *in situ* documentation taking place in the church, as well as research on funerary textiles based on computed tomography (CT) imaging.

**Keywords** CT imaging · Post-medieval funerary attire · Coffin textiles · Ethics · Mummified remains

### 5.1 Church Burials and Their Preservation in Northern Finland

In Finland, burials were conducted inside churches from the Middle Ages onwards. This burial tradition was first reserved for clergymen, but was later allowed for everyone who could afford to acquire a spot below the church floor. The coffins were usually placed in family-owned chambers constructed from timber, stone, or bricks, but coffins could also be placed individually between the chambers. In the chambers, several coffins were stacked on top of one another, and from time to time

---

S. Lipkin (✉)  
University of Oulu, Oulu, Finland  
e-mail: [Sanna.Lipkin@oulu.fi](mailto:Sanna.Lipkin@oulu.fi)

the chambers were cleared and the human remains deposited in an ossuary outside the church. The church burial tradition was particularly popular during the late 17th and early 18th centuries, when the under-floor space became crowded. Eventually the bad smell from the putrefying corpses and the fear of miasma—bad poisonous air that was believed to cause the spread of infectious diseases—led to criticism of the tradition in the late eighteenth century, and later its complete prohibition in 1822 (Kallio-Seppä & Tranberg, 2021).

Conditions below northern Finnish church floors are beneficial for the preservation of both human remains and organic materials, such as coffins, plants deposited inside the coffins, and textiles. The cold months when the temperatures drop close to or below freezing in the under-floor spaces is the most significant preserving factor. Based on evidence from the identification of the insects in the coffins, mummification of the remains took place most likely during the cold months, between October and March, whereas remains buried during the spring and summer decayed quite quickly. Despite the relatively high humidity throughout the year, as recorded below the floors, the free-moving air helped to remove the moisture causing the decomposition of the coffins (Väre et al., 2020). In addition, the conditions inside the coffin, as well as the plant materials and fabrics in the coffins, significantly affected the preservation of the human remains, as the coffin's plant-based bedding, such as antibacterial sawdust, hay, or birch bark, absorbed bodily fluids. Often, textile preservation is also near-perfect in burials where the remains have fully skeletonized. On the other hand, sometimes only a few fragmentary dry textiles have been recorded associated with both mummified and skeletonized remains. The differences in preservation are due to complex taphonomic processes, in which the interplay of bodily fluids, plant remains, and textiles is crucial. It needs to be highlighted that detailed documentation of the context in collaboration with specialists in different fields is necessary to understand both the preservation issues and the cultural and social concepts related to the burials (Lipkin et al., 2021b).

## 5.2 Research on Well-Preserved Burials

Archaeological inventories and documentation of the coffins have been conducted by researchers from the University of Oulu in four churches—Haukipudas, Kemina, Kempele, and Tornio—where altogether ca. 210 coffins have been observed. Documentation was undertaken in 1996 by a research group led by Kirsti Paavola, who wrote her dissertation on the subject, and in 2011, 2013–2014, and 2017–2019 by several researchers working in collaboration with the projects 'Church, Space and Memory', led by Titta Kallio-Seppä (2017–2019, funded by the Emil Aaltonen Foundation), and 'Daily and Afterlife of Children (1500–1900)' led by Sanna Lipkin (2017–2023, funded by the Academy of Finland). The total number of coffins below Finnish churches remains unknown. They are known to exist below several other churches, but apart from the abovementioned churches, no thorough inventorying has been conducted by archaeologists. In addition, some noble

families used to bury their deceased family members in private chapels, one of which we have documented in Vihti.

Of the inventoried coffins, ca. 130 have never been opened after their sealing for burial. The researchers documented the human remains and coffin interior only of those ca. 80 coffins that were broken or had been opened by previous visitors prior to these research inventories. The documentation has not been systematic. The earlier inventories in 1996 were done without the presence of either an osteoarchaeologist or a textile archaeologist. Altogether there are a few hundred coffins and individuals currently lying below the floors of northern Finnish churches, and it would take an enormous effort to document them all. Textile documentation would take a great deal of time, as there were several different textile types used in burials, varying from four to more than 20 different types per burial. For this reason, so far only a limited number of textiles in the coffins have been documented in detail.

Studying the funerary context is crucial to understanding funerary customs as well as taphonomical processes. The human remains, textiles, and plant remains as well as possible post-burial intrusions, such as rodent and insect activities or disturbance by humans, need to be documented. In this chapter, I will concentrate on the documentation practices for the coffins in the churches of Haukipudas and Keminmaa, and a private chapel at Kourla. At these sites, work has been conducted in collaboration with the following specialists: at Haukipudas and Keminmaa documentation of the remains in the coffins has been completed by Tiina Väre, archaeologist specialized in human osteology, Annemari Tranberg, an archaeologist specialized in entomology and macrofossil analysis, and textile archaeologist Sanna Lipkin. The same team, reinforced by Juho-Antti Junno (archaeologist specialized in osteoarchaeology) and Titta Kallio-Seppä (archaeologist, documentation of coffins), has also studied eight coffins in a private chapel on the estate of Kourla in Vihti, southern Finland. Kourla Chapel was built to serve as a family chamber tomb for the noble Toll family in Vihti, southern Finland. There are eight whole coffins with human remains in the chamber. Five of the remains are extensively mummified, one has some skin and muscle tissue preserved but is otherwise skeletonized, and one is fully skeletonized. One individual is in a coffin that is under another coffin. The full state of preservation of the lower coffin is impossible to know, but the remains seem mostly skeletonized. Except for this coffin, the remains and preserved coffin textiles and clothing were documented over a period of two days on 26–27 September 2020.

The current wooden church at Haukipudas (inaugurated in 1762) was built around the previous one, and before the construction work started, all burial chambers were covered with sand. About 16 coffins are still visible above the ground. Seven of these were documented *in situ* in 2014 and 2017. In three coffins the remains are mummified, but textile preservation is near-perfect in all the coffins, except in one with skeletonized adult remains where very few textile fragments were observed.

St. Michael's Church in Keminmaa is a sixteenth-century stone church that was abandoned in the 1790s after a new church was built nearby. Many of the 60 burials still visible below the floor date to the period after its abandonment. Most of them

belong to stillborn infants or infants under one year of age, some of whom were buried there after church burials were prohibited by law in 1822 (Satokangas, 1997: 428). Apparently, burying infants under the abandoned church was socially acceptable (Lipkin et al., 2021a). Most of these burials are not in chambers but are laid below the floor individually. As the space below the floor is very crowded and limited, only three coffins have been documented *in situ* at the church (in 2013 and 2018). These include the remains of Nikolaus Rungius (c. 1560–1629). His mummified remains were already famous during the eighteenth century, which led to the remains being moved from one coffin to another several times (Väre et al., 2021). All the documented remains at Keminmaa are mummified, but there is only a small quantity of textile fragments in two burials, those of Rungius and another adult male.

In this paper, the observations on *in situ* documentation practices of burial textiles are based on the experience of working in the crypts (five coffins at Haukipudas Church, three at Keminmaa Church, and seven at Kourla Chapel) as well as the documenting of three coffins from Haukipudas in the archaeology laboratory at the University of Oulu. In addition, eight coffins have been CT scanned at Oulu University Hospital. Three of these coffins are from Haukipudas and five from Keminmaa. In this paper, as a case study, I will present the documentation methods of the funerary textiles of one infant from Keminmaa, based on both *in situ* documentation at the church and documentation based on the CT scans.

### 5.3 Research Permissions and Ethics

In Finland, coffins and human remains below church floors are protected by several laws (Finlex Databank, 1963, 1993, 2003), and in accordance with these laws, researchers need several different kinds of permissions. First, the researcher will always have to have permission from the parish to visit the space under their church. Obtaining these permissions can be a delicate process. Generally though, the research is mostly welcome, and the vicars of the parishes are interested in knowing more about the heritage below their churches. With the permission of the parish, researchers can document the burials, but cannot do any invasive research. This means that it is possible to document the coffins and their contents without opening the lids. In some cases, the lids are broken, and it is possible to see the contents through holes, and sometimes the coffin lid is completely missing. It is possible to take notes and photographs without further permissions. To take samples or open the coffins, permission is needed from the Finnish Heritage Agency. To move the coffins, permission is needed from the Regional State Administrative Agency, which makes the decision on whether human remains can be removed from their original burial place or not. Such permissions are needed if we want to remove coffins, even temporarily, to study them in greater detail, for example by CT imaging.

Ethically the funerary attire and human remains should be viewed as a single entity. In many cases, the burial was designed by the living relatives or friends, who made decisions based on both cultural and religious perceptions. As archaeologists,

we should honour these decisions as much as we honour the human remains. For this reason, in the treatment of funerary attire it is advisable to follow, where applicable, the same ethical standards that are followed during research on human remains (BABAO, 2019; BABAO Code of Ethics, 2019; BABAO Code of Practice, 2019). Clothes may be considered as the second skin of humans; they are inseparable from the expression of identity and personhood. They are part of the essence of being human. It does not matter if the funerary attire was not real clothes worn in life; in many cases they were the clothes that were believed to be used after death (Lipkin, 2020).

In addition to these philosophical and ontological points of view, funerary textiles and human remains are also often physically inseparable. If textiles are unwrapped, human skin and bodily hair often remain on the pieces of fabric. In addition, body fluids have often stained the fabrics; they have become embedded with human tissue. These facts remain even if the body has fully skeletonized.

Textiles or skin cover most of the human remains situated below the church floors. This inevitably makes osteological analysis difficult by preventing the measurement of bones, and the recording of elements necessary for sex and age estimation, as well as the identification of possible pathologies. If textiles cover any so-called diagnostic parts of the human bones, unwrapping could be an option. However, unwrapping will always expose both the human remains and the textiles to the risk of damage. For this reason, if unwrapping is regarded as necessary, every step should be documented. However, unwrapping mummified remains is risky for their preservation. We have also made a deliberate decision not to intrude into coffins, and to touch the remains as little as possible, only while taking samples (Lipkin & Kallio-Seppä, 2021). In addition, it is not rare, at least in the Finnish post-Medieval context, for minute textile remains to have been preserved on the surface of the bone. For instance, in Köyliö, even though very little of the fibre material was still present, the pattern of the cap's bobbin lace was still visible on the surface of the skull (Fig. 5.1). This was noticed only by textile specialists, which demonstrates the benefit of showing human bones, as well as metal and other objects in the burials, to a textile archaeologist or conservator before they are cleaned.

It should also be carefully considered whether unwrapping the remains for documentation or conservation is necessary. Nevertheless, if they are unwrapped, textiles should always be rewrapped around the remains before their reinterment.

## **5.4 Challenges of Textile Documentation Below Church Floors, in Chambers, and the Laboratory**

The conditions below the church floors are extremely challenging. It is not possible to study the burials below floors when the churches are open to the public. To enter the space below, either floor planks need to be removed or researchers can use hatches in the floor. All the churches in this study are open to visitors and tourists



**Fig. 5.1** Remains of bobbin lace on the skull of a female individual from Köyliö Church, south-west Finland. (Photo: S. Lipkin)

during the summer. This leaves weekdays during spring, autumn, and winter for research. During these seasons, researchers will face the conditions that enabled preservation: the space below is cold and, if no modern construction work has taken place, the spaces may be well ventilated. It is difficult to take proper photographs, your fingers get cold quite quickly, your glasses easily fog up, breathing is difficult because of using a mask that is not suited to your face, and after a few hours the muscles and knees start to hurt. The space below the floor is also limited (Fig. 5.2). At times it is necessary to crawl, and being small can be regarded as advantageous for a researcher. Using knee pads is helpful. Often documentation needs to be done in awkward positions while prone. For instance, documenting Rungius' textiles was difficult, because he is located below the floor surface in a box. Unless the coffin is lifted from the box, a researcher can only reach the remains by lying on the floor on their stomach and bending over the coffin.

It is extremely difficult, and sometimes even unhealthy because of mould, to work in these conditions for a long period of time. Because of dust and mould, it is necessary to use FFP2 or FFP3 masks. In Kourla, even though we used such masks, during the first day the air inside the chamber was too stagnant and full of unhealthy particles, so that it was not possible for us to work more than about one hour continuously without getting dizzy. It is necessary to be careful while working below the floors. The sandy soil can lead to the risk of collapsing chamber walls. With the lack of space and poor visibility, it is essential to take care not to step or lean on burials that are hardly visible in the sand. In addition, at times good balance is needed while walking between the coffins.





**Fig. 5.2** Researchers entering a chamber in the church of Haukipudas. (Photo: S. Lipkin)

There is little or no natural light below the floors, which means researchers must bring adequate lamps with them. These need to have appropriate stands that can be placed on the coffin edges, on the bottom of the coffin, or held in the hand. To use the coffin edges, they need to be sturdy enough and have no textiles on their surface, which also applies to putting the lamps on the bottom of the coffin. Often there is not enough space for documentation assistants, but having one or two assistants makes documentation and taking measurements easier. The conditions also pose difficulties for placing scales for photographs. Properly focused photos with adequate scales are necessary for textile structural analysis. It is much easier to study the weave structures (e.g. counting thread counts) from the images if the scale is positioned at right-angles to the textile's weave structure. In the conditions below the church floor, it is not always possible to take photographs with scales. For proper focus on both scale and textile, they should be on the same level. There are very few flat surfaces on human remains, and such remains are often too fragile to put a scale on them (Fig. 5.3). The challenging conditions below the floors does not allow the use of photogrammetry for documentation. We have experimented with using laser scanning to locate the coffins, but the dark conditions created voids in the results, and we found processing the large output files to be unproductive in comparison to understanding the use of the space through photographs and videos.

For photographic documentation, using multiple lenses is optimal. A macro lens such as a Canon macro lens EF-S 35 mm, with a micro focal distance of 0.13 m- $\infty$ , is suitable for taking photographs of whole textiles, but for the structural analysis of the finest textiles, a more precise macro lens, such as a Canon macro lens EF





**Fig. 5.3** Photographing with a heavy camera with a macro lens can be tricky. In an awkward position it is very difficult to hold a camera steady and get it focused on the textile instead of, for example, a spider on the textile (here unfocused in the middle of the image). Taking adequate photographs with proper scales for structural textile analysis can be difficult, as there are no flat surfaces on human remains. In the image are fine-quality nettle and cotton textiles that were recorded on the skin of the right thigh of Rungius. (Photo: Sanna Lipkin)

100 mm, with a micro focal distance of 0.31 m- $\infty$ , or a Laowa 100 mm f/2.8 2:1- $\infty$  is needed. These lenses are, however, very heavy, and difficult to handle in the challenging conditions and positions. To protect the delicate optics of the cameras from dust, we put them in resealable plastic bags, only taking them out while taking photographs. Considering the difficult conditions, inaccuracies in documentation are evident. However, our emphasis on minimal disturbance ensures that the remains will still be below the floors and can usually be visited again later.

Naturally, it is impossible to take computers and portable microscopes below the church floors. In the laboratory, documentation of the textiles and human remains is easier, but we also need to bear in mind that taking coffins out from these dark under-floor spaces exposes them to light that can be harmful for their future preservation. Therefore, when laboratory-based documentation did take place, this work was carefully scheduled to avoid unnecessary light exposure. Three coffins from Haukipudas that were CT scanned were documented and stored overnight in the archaeology laboratory at the University of Oulu. They had been transported to Oulu University Hospital for CT scanning and were awaiting transportation back to the church. At some point in history, these coffins had been opened by curious church visitors, and for this reason it was decided to fully document the burials. This took place during the evening of 1 April 2014 and the morning of 2 April 2014. The

time was limited, but sufficient for photographing the remains with a scale and taking microscopic photos with a Dinolite microscope (AM-413 T). Even though it was easier to take photographs in laboratory conditions with proper light using the Dinolite microscope was still challenging. Our aim was to touch the fabrics as little as possible, and as the textiles were not on a flat surface (except for those on the coffin edges), the portable microscope needed to be gently held with a steady hand just above the surface of the fabric.

In addition to photographs, written descriptions of the textiles, as well as sketches and, if possible, scale drawings of the coffins with human remains and funerary attire, are important (Fig. 5.4). Notes were jotted down during the examination in notebooks, and later textile documentation sheets were compiled based on those notes and photographs. On the documentation sheets, attention was paid to how the fabrics were folded and attached to the coffin and the deceased, the general appearance of the fabric (density, thickness, colour, decorative elements, possible fibre



**Fig. 5.4** Sketch (left) indicating the placement of funerary fabrics in Burial 4 at Kourla Chapel. This information can be supplemented by the photographs (right). (Drawing: Tiina Väre & Sanna Lipkin. Photo: Sanna Lipkin)

material), and the preservation of the fabric (state of preservation, staining, possible change of colour).

In addition, thread samples were collected from those textiles that were suitable for sampling. Samples were cut with a scalpel or scissors from ripped edges. Intact fabrics were not cut for samples. In eight coffins at Haukipudas, at least 73 different fabrics below and above the body, including caps, stockings, and floral accessories, were recorded. A total of 18 samples were collected from four coffins. At Keminmaa, four different textiles were identified and sampled from Rungius' skin, two textiles were recorded and sampled from another burial (adult male) and, as will be discussed in more detail later in this paper, 15 textiles were identified in Burial 10, from which 11 samples were collected from the damaged edges of the fabrics. At Kourla, a total of 36 fabrics, accessories, or clothing items were identified *in situ* in seven coffins. Fabric samples were collected from most of the textiles, and in cases where it was unclear whether two textiles were originally produced from one fabric or two different fabrics, samples were collected from both fragments. In addition, organic matter was collected from different parts of the coffins to analyse whether the samples contain any fibre remains not visible to the naked eye. Seventy samples were collected at Kourla.

During the inventories in Haukipudas and Keminmaa, only short thread samples of 0.5 to 1 cm in length were collected from each weaving system. However, experience shows that, if possible, small samples around  $0.5 \times 0.5$ – $1.0 \times 1.0$  cm would be more appropriate for textile documentation in the laboratory. The images taken below the churches are often too dark, in some cases too inaccurate, or taken from too far away, that they are of little help in the analysis of textile structures. At Kourla, whenever possible, larger samples were cut with pointed scissors.

## 5.5 CT Imaging Conducted at Oulu University Hospital and Its Observed Challenges

Computed tomography imaging has been widely used for research on mummified remains (Zur Nedden et al., 1994; Wade et al., 2012; Beckett & Conlogue, 2021; Loynes & Bianucci, 2020). However, CT imaging has been less often used to study the material culture and fabrics associated with human remains. The methodology has been used to, for instance, study pottery (Applbaum & Applbaum, 2005), read text from rolled papyrus (Lin & Seales, 2005), identify Roman coins (Miles et al., 2016), and study knotted-pile carpets (Serrano et al., 2021).

Using two-dimensional cross-sectional X-ray images perpendicular to the axis of the imaging system, CT scanning creates three-dimensional reconstructions of the imaged tissues and other materials. It is based on the different densities of the materials and tissues, calculated from the qualities of the X-ray beams passing through the analysed items or bodies. The image intensity reflects the density of the object, whereas the resolution is dependent on geometric magnification. Two-dimensional

pixels display the mean attenuation of the tissue or material determined based on Houndfield Units (HU). The HU scale is a linear transformation of the attenuation measurement, in which the radiodensity of water is 0 HU and air -1000 HU. When the slice thickness is added, the units are called voxels. Three-dimensional reconstructions are based on mathematical algorithms transforming voxel information into digital images.

Eight coffins from the northern Finnish churches were CT scanned at the University Hospital at Oulu. One of the scanned coffins belonged to vicar Nikolaus Rungius. His remains have been studied in detail by Tiina Väre in her PhD dissertation (Väre, 2017). The other coffins belong to seven newborns or infants. From Keminmaa, two of the scanned newborns and infants were mummified and two mainly skeletonized (Lipkin et al., 2021a). From Haukipudas, one of the newborns was skeletonized and the other two newborns were mummified. Moving the coffins for CT scanning exposes them to breakage. Currently, Rungius lies in a coffin that was made during the early twentieth century, which was sturdy enough to be transported from Keminmaa to Oulu (about 100 km). The infant coffins were selected for their small size, and the scanned coffins were those that were the most easily reached, the closest to the hatches, and the best preserved.

The scans were conducted at Oulu University Hospital by radiologist Jaakko Niinimäki (M.D. PhD) using a Somatom Definition Flash dual-source CT scanner (Siemens Healthcare, Forchheim, Germany) (Lipkin, 2020). Full-body images were acquired at 100 kV and 140 kV, with an in-plane resolution of  $0.68 \times 0.68$  mm and a slice thickness of 0.5 mm, which is adequate for viewing how textiles are positioned in the burial and for making general observations on the different densities of fabrics. However, this resolution is not enough for detailed textile structural analysis. Only dental areas were rescanned with an in-plane resolution of  $0.16 \times 0.16$  mm and a slice thickness of 0.6 mm. Initially the main motivation for scanning was to gather evidence for research on the human remains, rather than the textile remains particularly. Even though CT scanning is non-destructive and non-disruptive, the objects are subjected to radiation that may impact the preservation of ancient DNA and in the future prevent successful sampling (Grieshaber et al., 2008; Loynes & Bianucci, 2020).

Because CT imaging is three-dimensional, it is best to view images of the analysed items on a desktop computer, which enables features to be examined from different angles and settings. The CT-scanning output files were viewed and images reproduced using the OsiriX MD 12.5.2 software package. It was difficult to reproduce the full results of the scan, because especially light fabrics, such as tulle, are close to air in density. For this reason, fabrics are always much more transparent and harder to distinguish in comparison to other tissues, as it is particularly difficult to make them visible in the scanning output images and their segmentation is difficult (Karjalainen et al., 2023; Lipkin et al., 2023). Coffin nails create imaging artefacts caused by beam hardening from their high density. Whereas streaking artefacts make it more difficult to view coffin structures, they have no effect on textile examination. The advantage of CT scanning is that produces transparent images, but it does not provide colour information.

The coffins from the northern Finnish churches were scanned with a resolution of 680  $\mu\text{m}$  (and 160  $\mu\text{m}$  for the teeth area), which is not adequate for textile structural analysis. For this reason, structural analysis of these textiles was based on macroscopic and microscopic photographs. However, they can also be further studied by micro CT imaging the collected samples. In another context, we have successfully micro CT scanned archaeological textiles with resolutions of 6.7  $\mu\text{m}$  and 0.7  $\mu\text{m}$  (Karjalainen et al., 2023; Lipkin et al., 2023). While studying historical knotted-pile carpets, Serrano et al. (2021) used a resolution of 400  $\mu\text{m}$  for the CT scanning and 30–37.2  $\mu\text{m}$  for micro CT scanning, and found CT scanning suitable for observations on the condition of a complete object, and micro CT scanning could reveal details difficult to attain with any other technique.

## 5.6 Observed Benefits of CT Imaging

CT imaging makes it possible to view materials—textile, bone, metals, and wood—of different densities separately. In addition, it is easy to delete data that impedes the view of the material under study; for instance the foot of the coffin can be virtually cut away in order to view the interior from that angle. It is also possible to view what lies beneath the top layers of fabrics, and to see if there is preserved fabric below the deceased.

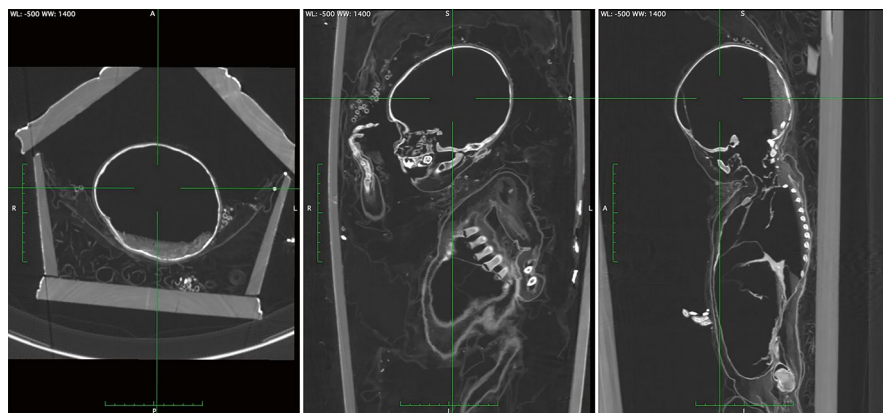
One of the greatest advantages of CT imaging is that it enables the interior of the coffins to be studied without opening the lids and unwrapping the fabrics. In addition to osteological analysis, CT imaging is suitable for examining the arrangement of the textiles in the burial, as well as seeing different layers of textiles in cross-section. Multiplanar imaging enables viewing in the transverse, coronal, or sagittal plane, depending on what needs to be examined (Fig. 5.5).

## 5.7 Mummified Infant in Burial 10 at Keminmaa

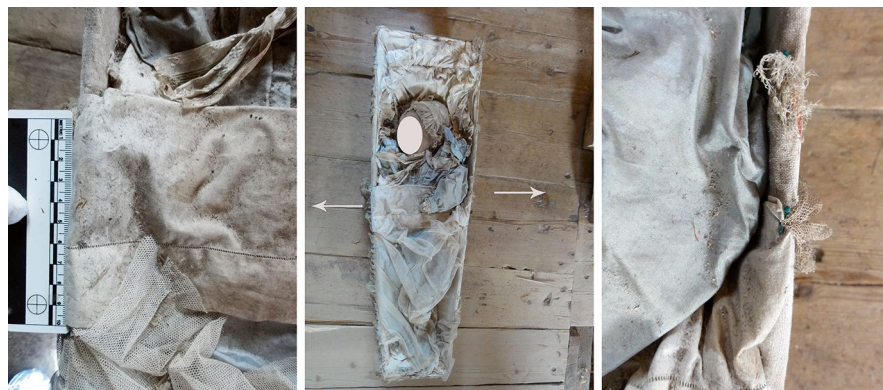
An example of research on a coffin and the associated textiles belonging to an infant in Burial 10 at Keminmaa shows well the benefits of both *in situ* documentation at the church and documentation based on CT-scan images. The CT scan was crucial for the identification of the sex and age of the infant. As viewed from the CT scan, based on the preserved soft tissues, the burial belongs to an infant girl, and her age at death is estimated to have been 3–6 months old based on ossification centres (Lipkin et al., 2021a). In addition to bones and skin, it is also possible to view the infant's inner organs and veins on the CT scan.

Most of the textiles in this burial have been preserved intact and retain their pliability. At least 15 different fabrics, ribbons, and laces were used to furnish the coffin and dress the infant. During *in situ* documentation at the church, it was observed that the infant was buried wearing a light blue silk dress made from pieces of fabric





**Fig. 5.5** All three planes (cross-sections) of Burial 10 at Keminmaa from the same point. On the left (transverse) can be seen organic material inside the skull of the infant, bird cherry pits in the bottom of the coffin and right side of the skull, as well as wood shavings and a birch bark roll mattress below a pillow and a layer of mattress-cover textile. In the middle (coronal) can be seen layers of skin and textile, as well as a few pins on the coffin edges. On the right (sagittal) can be seen the pillow, mattress, layers of textiles, and the metal stem of an artificial flower inside the hand of the infant. Below the head inside the mattress is a piece of wood, most likely a disregarded piece of coffin foot. (CT image by Sanna Lipkin)



**Fig. 5.6** Infant in Burial 10 at Keminmaa lies in a light blue coffin that was furnished as a bed. She was covered with light blue silk fabric arranged to resemble a dress, with cut-out seams tucked below a rectangular fabric piece placed under her left arm. She lay under a tulle blanket. The same fabric was used for the cap, and the same kind of tulle fabric also hangs outside the coffin. All fabrics were pinned to the fabric that covered the coffin walls, which itself was attached to the coffin with red sealing wax. During documentation the coffin was lifted onto the church floor to provide more space around it. (Photos: Sanna Lipkin)

for the burial. On the upper body, white fabric folded in two layers had been placed on the deceased and the cut seams of the light blue silk were tucked below the white fabric, creating the impression that the infant was covered with a blanket (Fig. 5.6).

Light blue silk fabric was also wrapped around the arms of the infant. The cuffs were sewn with coarse stitches, with decorative lace sloppily added between the seams (Fig. 5.7). At one spot below the silk, a white cotton 'petticoat' fabric covering the lower body was observed. On the lower part of the body, on the silk, lay a cotton tulle fabric typical of the mid-nineteenth century (Marks, 1959: 569), covering the infant as if she was sleeping below a blanket. This same tulle was also used in the other parts of the burial (Fig. 5.6).

The coffin walls were covered with undyed bast-fibre fabric. The cut seam of this fabric is visible at the foot end of the coffin. Both the silk and tulle fabrics were attached to the coffin-wall fabric with pins, but are now torn in the area of the feet. At this spot is a white square fabric that had been folded and placed below the body, with the cut edges originally folded out of sight. The coffin-wall fabric was attached



**Fig. 5.7** Above: Paper flowers and leaves were attached with pins to the tulle hanging outside the coffin. Below: The seam on the cuff was roughly sewn and the lace hastily attached. (Photos: Sanna Lipkin)



to the coffin edge with red sealing wax. These clumps of wax are only occasionally observed where the coffin-wall fabric has not preserved or the wax has stained the fabric. The mattress was covered with white cotton fabric that was attached to the wall fabric with pins. Pleated tulle hanging outside the coffin was also attached with pins. In addition, small flowers and leaves made from paper were attached with pins to the tulle hanging outside the coffin (Fig. 5.7). The pillowcase was decorated with bobbin lace.

The infant wore a cap made from tulle with embroidered floral decorations. On the forehead was plaited tulle and bobbin lace (Fig. 5.8). The seam between the lace and cap was covered with a wide white silk ribbon. Two pieces of this same ribbon were also placed below the chin as if they should have been tied together in that position, but the arrangement would not have worked practically. On the chest was

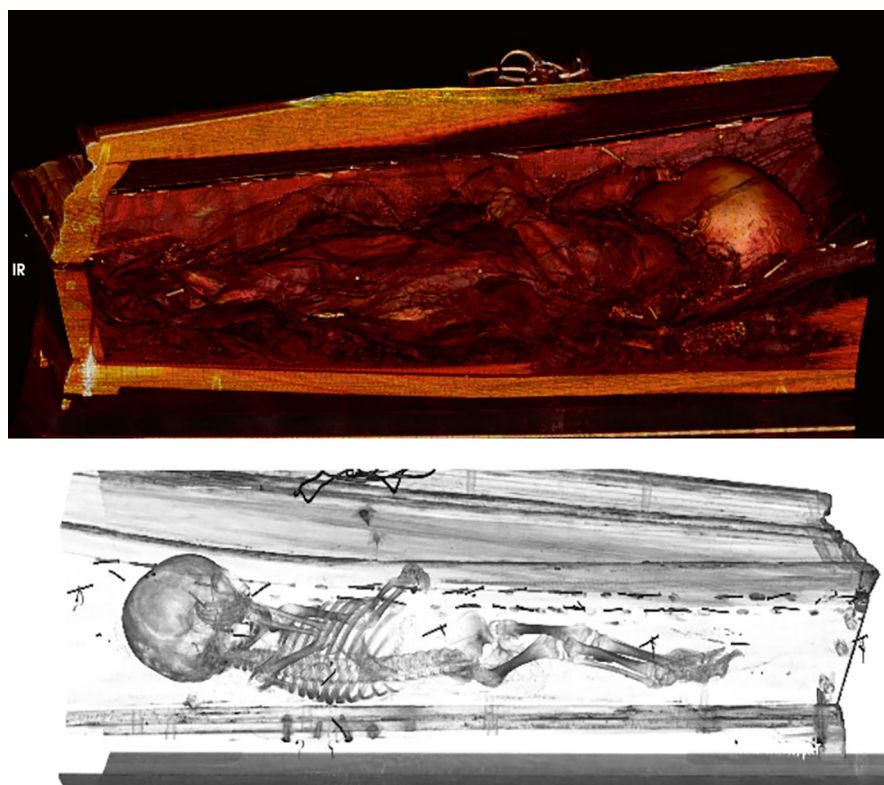


**Fig. 5.8** Infant's cap made from tulle decorated with floral ornaments and dots that are also visible in the CT scan image. The cap's lace is not visible in the upper right image, but was sewn on the tulle on the forehead. The silk ribbon is similar to that used to tie the cap below the chin. Lace on the chest is visible in the CT-scanning image as a row of circles. The CT scan also reveals that the infant held a metal stem in her left hand. (Photo: Sanna Lipkin, 2014, reconstructed CT images by Sanna Lipkin)

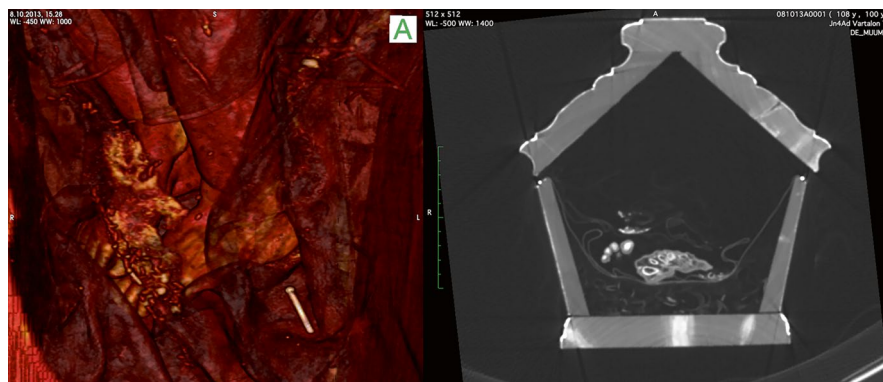
a strip of white fabric with bobbin lace that has no identified purpose in the funerary attire, but is similar to the lace on the cuffs (Fig. 5.8).

A collapsed crown twisted from bronze wire and covered with yarn was placed on the coffin and attached with a now greenish silk band (Fig. 5.9). On the textiles are a few wood shavings and raw flax fibres that were likely brought up from the bottom of the coffin by a rodent.

The CT scan gives a more detailed view of the interior contents of the coffin and what can be found at the bottom. As well as the activities of the rodent, the following observations inferences could only be made from information obtained from the CT scans. Numerous bird cherry pits (*Prunus padus*) can be observed on the body but also below the skull (Figs. 5.5 and 5.8). Even though some shavings and flax from the mattress were observed on the textiles, it is the CT scan that has revealed



**Fig. 5.9** CT-scanning images with different window lengths of Burial 10 at Keminmaa. In the upper image, fabrics and skin are visible, whereas in the lower image only wood, bone, and metal items are seen. From both images it is possible to see that there are numerous pins and lumps of seal wax along the edges of the coffin. These attached the fabrics. There are also pairs of pins outside the coffin marking places where paper flowers were attached. On the coffin is the metal base of the collapsed crown. Both the wooden and iron nails of the coffin are also visible. (Reconstructed CT images by Sanna Lipkin)



**Fig. 5.10** CT-scanning images show the fabrics in the foot area of Burial 10 at Keminmaa. The ‘petticoat’ has a narrow seam, and the infant had no stockings on her feet. She lay on fabric that was folded on top of the mattress cover. In the right-hand image (transverse plane), the blue silk garment and the tulle are not visible, but can be faintly seen in the left-hand image. On the feet is some dense matter, probably metal, and in the left-hand image it can be seen to sit between the ‘petticoat’ and silk fabrics. (Reconstructed CT images by Sanna Lipkin)

it is likely that the mattress was also composed of birch bark rolls. Among this organic material, at the head end of the coffin, a piece of wood, most likely a decorative piece of the coffin, was observed (Fig. 5.5). In addition, the scans show the placement of both the iron and wooden nails of the coffin, as well as the pins that attached the silk, tulle, and paper flowers outside the coffin, and the mattress fabric (Fig. 5.9).

The CT scan shows more detail as to how the fabrics were placed below the top layers. For instance, the otherwise mostly invisible fabric just below the body and covering the mattress fabric is seen as finely undulating. It is also obvious that the cotton ‘petticoat’ fabric has a narrow seam and extends only to the middle of the shin (Fig. 5.10). On the other hand, the infant had no stockings on her feet. The CT-scanning images also reveal that the infant held a metal stem of a now decayed artificial flower sprig in her hand (Figs. 5.5 and 5.8). In addition, some sort of dense matter, possibly metal, was observed on her feet between the ‘petticoat’ and silk dress (Fig. 5.10). In the CT scan it is possible to see the pleats of the textiles, the circular pattern of the bobbin lace, and the floral decoration of the tulle cap (Fig. 5.8).

## 5.8 Conclusion

In the case of northern Finnish burials located beneath church floors, *in situ* documentation is most fruitful when it is conducted both on site and by CT imaging. Both methods provide significant information about the placement of fabrics and burial customs. Even though church burials can be visited several times, opening coffins and touching them can expose them to the risk of damage and unnecessary

light. CT scans can easily be viewed multiple times, and often reveal aspects that were not observed when documenting the burials *in situ* below the church floor. In the future, as they are also archived, they are accessible to other researchers.

The selection of the methodology is naturally dependent on the research questions. As highlighted with the case study from Keminmaa, the benefit of imaging is that, in addition to observations on preservation, it enables us to see how textiles were structured on the deceased, and how pins and other metal accessories—even those covered by fabric layers—were used to achieve this. This information has been crucial in my own research, where the goal has been to study how children's coffins were prepared, and how they reflected the emotions of the surrounding community (Lipkin et al., 2021b, 2022). As so far my objective has been to understand how individuals were buried according to their gender and social status, and to investigate religious and emotional aspects of burial customs, it has not been crucial to know, for instance, exactly what fibre materials were used for the fabrics. However, having this information available, through collecting samples, opens possibilities for future research that could, for example, explore the origins and trade routes of the fabrics.

Observations of burials have piqued my interest in the mummification process, embalming, and the role of textiles in the preservation and decay processes. Within this work, sampling the textiles, as well as detailed *in situ* documentation, both below the churches and through CT imaging, are important steps.

Despite the difficult conditions below the floors, the non-invasive or micro-invasive research we have conducted has provided important insights into past burial customs and how textiles were used in constructing the burial. It is important to consider ethical issues when researching human remains and burials, and the relevant permissions needed for research, sampling, and possible transportation.

**Acknowledgements** I would like to thank my collaborators who have explored the spaces below the church floors and documented the burials and textiles with me. Many thanks to Titta Kallio-Seppä, Tiina Väre, Annemari Tranberg, Juho-Antti Junno, Erika Ruhl, and Saara Tuovinen. This research was funded by the Academy of Finland (Decision numbers 309607 and 322783).

## References

- Applbaum, N., & Applbaum, Y. (2005). The use of medical computed tomography (CT) imaging in the study of ceramic and clay archaeological artifacts from the Ancient Near East. In M. Uda, M. Demortier, & I. Nakai (Eds.), *X-rays for archaeology*. Springer. [https://doi.org/10.1007/1-4020-3581-0\\_17](https://doi.org/10.1007/1-4020-3581-0_17)
- BABAO recommendations on the ethical issues surrounding 2D and 3D digital imaging of human remains. (2019). <https://www.babao.org.uk/assets/Uploads/BABAO-Digital-imaging-code-2019.pdf>. Accessed 11.11.2021.
- BABAO Code of Ethics. (2019). <https://www.babao.org.uk/assets/Uploads/BABAO-Code-of-Ethics-2019.pdf>. Accessed 11.11.2021.
- BABAO Code of Practice. (2019). <https://www.babao.org.uk/assets/Uploads/BABAO-Code-of-Practice-2019.pdf>. Accessed 11.11.2021.



- Beckett, R. G., & Conlogue, G. J. (2021). Radiology applications in mummy science. A practical approach. In D. H. Shin & R. Bianucci (Eds.), *The handbook of mummy studies, new Frontiers in scientific and cultural perspectives*. Springer Nature. [https://doi.org/10.1007/978-981-15-1614-6\\_46-2](https://doi.org/10.1007/978-981-15-1614-6_46-2)
- Finlex Data Bank. (1963). *Muinaismuistolaki (The Antiquities Law)*, 17.6.1963/295. Finlex Data Bank. <https://www.finlex.fi/fi/laki/alkup/1963/19630295>. Accessed 8.11.2021.
- Finlex Data Bank. (1993). *Kirkkolaki (The Church Law)*, 26.11.1993/1054. Finlex Data Bank. <https://www.finlex.fi/fi/laki/ajantasa/1993/19931054?search%5Btype%5D=pika&search%5Bpika%5D=kirkkolaki>. Accessed 8.11.2021.
- Finlex Data Bank. (2003). *Hautausuimilaki (The Funeral Act)*, 6.6.2003/457. Finlex Data Bank. <https://finlex.fi/fi/laki/ajantasa/2003/20030457#L8P24>. Accessed 8.11.2021.
- Grieshaber, B. M., Osborne, D. L., Doubleday, A. F., & Kaestle, F. A. (2008). A pilot study into the effects of X-ray and computed tomography exposure on the amplification of DNA from bone. *Journal of Archaeological Science*, 35(3), 681–687. <https://doi.org/10.1016/j.jas.2007.06.001>
- Kallio-Seppä, T., & Tranberg, A. (2021). The materiality of odors: Experiencing church burials and the urban environment in early modern Northern Sweden. *Historical Archaeology*, 55(1), 65–81. <https://doi.org/10.1007/s41636-020-00264-2>
- Karjalainen, V. P., Finnilä, M. A. J., Salmon, P. L., & Lipkin, S. (2023). Micro-computed tomography imaging and segmentation of the archaeological textiles from Valmarinniemi. *Journal of Archaeological Science*, 160, 105871. <https://doi.org/10.1016/j.jas.2023.105871>
- Lin, Y. H., & Seales, W. B. (2005). Opaque document imaging: Building images of inaccessible texts. *Tenth IEEE International Conference on Computer Vision (ICCV'05)* (Vol. 1, pp. 662–669).
- Lipkin, S. (2020). The clothed dead body in northern Ostrobothnian Finland between the 17th and mid-19th centuries. In T. Äikäs & S. Lipkin (Eds.), *Entangled beliefs and rituals (Monographs of the Archaeological Society of Finland)* (Vol. 8, pp. 54–69) [http://www.sarks.fi/masf/masf\\_8/MASF8-3-Lipkin.pdf](http://www.sarks.fi/masf/masf_8/MASF8-3-Lipkin.pdf)
- Lipkin, S., & Kallio-Seppä, T. (2021). Introduction: Studying under-floor church burials in Finland—Challenges in stewarding the past for the future. *Historical Archaeology*, 55, 1–10. <https://doi.org/10.1007/s41636-020-00267-z>
- Lipkin, S., Niinimäki, S., Tuovinen, S., Maijanen, H., Ruhl, E., Niinimäki, J., & Junno, J. A. (2021a). Newborns, infants, and adolescents in Postmedieval Northern Finland: A case study from Keminmaa. *Historical Archaeology*, 55(1), 30–48. <https://doi.org/10.1007/s41636-020-00265-1>
- Lipkin, S., Ruhl, E., Vajanto, K., Tranberg, A., & Suomela, J. (2021b). Textiles: Decay and preservation in seventeenth- to nineteenth-century burials in Finland. *Historical Archaeology*, 55(1), 49–64. <https://doi.org/10.1007/s41636-020-00270-4>
- Lipkin, S., Tranberg, A., Kallio-Seppä, T., & Ruhl, E. (2022). Preparing children's burials in Postmedieval Finland: Emotions awakened by sensory experiences. *Historical Archaeology*, 56, 184–198. <https://doi.org/10.1007/s41636-022-00343-6>
- Lipkin, S., Karjalainen, V. P., Puolakka, H. L., & Finnilä, M. A. J. (2023). Advantages and limitations of micro-computed tomography and computed tomography imaging of archaeological textiles and coffins. *Heritage Science*, 11, 231. <https://doi.org/10.1186/s40494-023-01076-2>
- Loynes, R. D., & Bianucci, R. (2020). Medical imaging in mummy studies. Technical aspects. In D. H. Shin & R. Bianucci (Eds.), *The handbook of mummy studies, new Frontiers in scientific and cultural perspectives*. Springer Nature. [https://doi.org/10.1007/978-981-15-1614-6\\_39-1](https://doi.org/10.1007/978-981-15-1614-6_39-1)
- Marks, S. S. (Ed.). (1959). *Fairchild's dictionary of textiles*. Fairchild.
- Miles, J., Mavrogordato, M., Sinclair, I., Hinton, D., Boardman, R., & Earl, G. (2016). The use of computed tomography for the study of archaeological coins. *Journal of Archaeological Science: Reports*, 6, 35–41. <https://doi.org/10.1016/j.jasrep.2016.01.019>
- Satokangas, R. (1997). Murroksen aika (1860–1930). In P. Koivunen, J. Vahtola, R. Satokangas, & M. Itkonen (Eds.), *Keminmaan historia* (pp. 250–443). Keminmaa.

- Serrano, A., Meijer, S., van Rijn, R. R., Coban, S. B., Reissland, B., Hermens, E., Batenburg, K. J., & van Bommel, M. (2021). A non-invasive imaging approach for improved assessments on the construction and the condition of historical knotted-pile carpets. *Journal of Cultural Heritage*, 47, 79–88. <https://doi.org/10.1016/j.culher.2020.09.012>
- Väre, T. (2017). *Osteobiography of Vicar Rungius. Analyses of the bones and tissues of the mummy of an early 17th-century Northern Finnish clergyman using radiology and stable isotopes. Acta Universitatis Ouluensis B Humaniora 150*. University of Oulu. <http://jultika.oulu.fi/files/isbn9789526215259.pdf>
- Väre, T., Tranberg, A., Lipkin, S., Kallio-Seppä, T., Väre, L., Junno, J. A., Niinimäki, S., Nurminen, N., & Kuha, A. (2020). Temperature and humidity in the base-floors of three Northern Finnish churches containing 17th–19th-century burials. *Acta Universitatis Lodziensis, Folia Archaeologica*, 35, 189–214. <https://doi.org/10.18778/0208-6034.35.12>
- Väre, T., Lipkin, S., Suomela, J. A., & Vajanto, K. (2021). Nikolaus Rungius: Lifestyle and status of an early seventeenth-century Northern Finnish Vicar. *Historical Archaeology*, 55(1), 11–29. <https://doi.org/10.1007/s41636-020-00268-y>
- Wade, A. D., Ikram, S., Conlogue, G., Beckett, R., Nelson, A. J., Colten, R., Lawson, B., & Tampieri, D. (2012). Foodstuff placement in ibis mummies and the role of viscera in embalming. *Journal of Archaeological Science*, 39(5), 1642–1647. <https://doi.org/10.1016/j.jas.2012.01.003>
- Zur Nedden, D., Wicke, K., Knapp, R., Seidler, H., Wilfing, H., Weber, G., Spindler, K., Murphy, W. A., Hauser, G., & Platzer, W. (1994). New findings on the Tyrolean ‘ice man’: Archaeological and CT-body analysis suggest personal disaster before death. *Journal of Archaeological Science*, 21(6), 809–818. <https://doi.org/10.1006/jasc.1994.1078>

**Sanna Lipkin**, PhD, is a University Research Fellow at the University of Oulu, and holds the Title of Docent in Textile Archaeology at the University of Turku. Her research interests lie in understanding childhood in the past, as well as well-being, emotions, and attachment bonds during the period 1300–1900.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter’s Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter’s Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



## Chapter 6

# Textiles and Bones on Site: A First-Hand Experience from the Cemeteries at Naqlun (Egypt) and Crypts at Old Dongola (Sudan)



Barbara Czaja and Robert Mahler

**Abstract** This paper describes the on-site cooperation between a textile specialist and a bioarchaeologist, using three examples from ongoing fieldwork: two cemeteries at Naqlun in Egypt, dated to the fifth–seventh and eleventh–thirteenth centuries CE, and medieval crypts in Old Dongola, Sudan; thereby offering three different settings and various standpoints. The two first cases, at Naqlun, consist respectively of Late Antique mummy-like burials set in tombs cut in the bedrock, and coffin burials set in pit graves located among sand-covered ruins. The third case, in Old Dongola, concerns shrouded bodies laid in subterranean tombs, vaulted and built with bricks under the floor of a monastery building. This paper describes these settings and the way we dealt with the different problems encountered.

We both have a background in archaeology. By combining our expertise—on textiles and osteology—we were able to develop a degree of understanding allowing us to get the most from the fieldwork conducted and not to compromise either bone or textile evidence. Here we present our reflections on our long standing cooperation and its results.

**Keywords** Textiles · Burials · Human bones · Naqlun · Egypt · Old Dongola · Sudan · Archaeological excavation

---

B. Czaja (✉)

Prevention and Conservation Department, Museum of King Jan III's Palace at Wilanów, Warsaw, Poland

R. Mahler

Polish Centre of Mediterranean Archaeology, University of Warsaw, Warsaw, Poland

© The Author(s) 2025

E. Yvanez, M. M. Wozniak (eds.), *Funerary Textiles in Situ*, Interdisciplinary Contributions to Archaeology, [https://doi.org/10.1007/978-3-031-69461-5\\_6](https://doi.org/10.1007/978-3-031-69461-5_6)

117



## 6.1 Introduction

Textiles are very delicate and therefore difficult to excavate. Some of them can be restored to regain most of their original splendour, but not without meticulous, arduous conservation work that takes a great deal of time to carry out properly. However, the resulting effect is well worth the effort. Frequently, when acquired during archaeological excavations, textiles are taken to the lab in the form of a heap of dirty, torn fragments that are creased and stuck together, and whose original appearance and form can only be ascertained after undergoing conservation.

Fortunately for us, the environmental conditions in most places in which we work—both in Egypt and in Sudan—are very kind to textiles. Archaeological excavations undertaken at the majority of the sites there frequently uncover very well-preserved textiles. Small fragments are usually found among the ruins of houses, hermitages, and monastery buildings. These were mainly garbage discarded by their owners when damaged (Czaja-Szewczak, 2000: 135–142). Burials at cemeteries, or inside crypts, can yield better preserved textiles, some of which are of considerable size or even complete. These include clothes.

Our observations on the excavation of graves and conservation of textiles are based on first-hand experience gained when working at two archaeological sites, at Naqlun in Egypt and at Old Dongola in Sudan; that is, in very different settings. In the following considerations, special attention is paid to cooperation between a textile specialist and a bioarchaeologist carrying out an investigation together. Without the conscious and harmonious combination of their knowledge and experience, the research potential of a burial can not be fully realized. Taking into account the destructive nature of archaeological excavation, there is usually only one opportunity to collect data *in situ*, hence the importance of effective cooperation among the specialists involved.

## 6.2 Burial Location Types and Their Role in Textile Preservation

Fungi and bacteria cause the most damage to textiles recovered during archaeological excavations. Plant fibres that contain cellulose, such as cotton, flax, hemp, and jute, are particularly susceptible. Plant-based textiles are destroyed by the microorganisms that decompose fibres. When fungi are responsible, colourful spots appear. Basidiomycete fungi are the most potent degraders of cellulose. Microorganisms that feed on finishes, dyes, and various substances that contaminate textiles also grow alongside them. Animal textiles are composed mainly of proteins, the exact forms of which are characteristic of particular fibres. Those based on keratin, a type of protein from the family of scleroproteins, are destroyed mainly by bacteria, less so by fungi. In contrast, natural silk, composed largely of fibroin protein, is destroyed mainly by fungi.

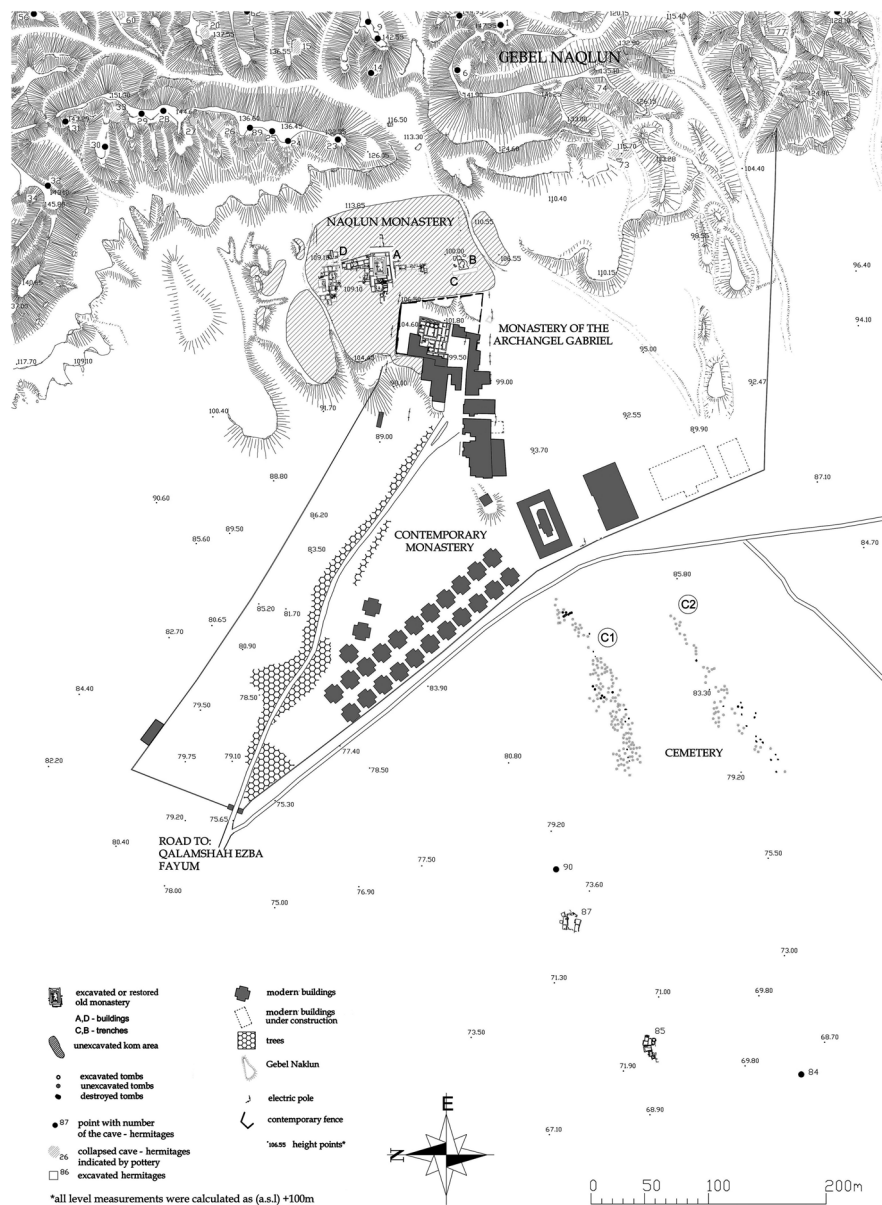
Archaeological textiles from burials are particularly at risk of destruction by microorganisms. Textiles from burials are full of spots and discolourations that, over time, can completely change their original colour. Such spots and discolourations are the result of long-lasting contact with body-decomposition products and the growth of fungi. In areas in which body-decomposition products were active for a long time in abundance, the textile fibres usually stick together and become stiff. As a result, they become brittle, break easily, and, as a rule, are more discoloured.

At Naqlun, we studied graves in two extensive cemeteries. The earlier one, Cemetery C, dated to Byzantine times, is located in the immediate vicinity of the oldest hermitages of the western group, built near the Bahr El-Gharaq (Gr. Polemon) channel (Fig. 6.1). Graves in the second cemetery, Cemetery A, dated to the eleventh–thirteenth centuries, were discovered near the neighbouring hills, among the ruins of the central complex of the Medieval monastery, which is known today as Deir El-Malak Gabriel. It is the oldest monastery in Fayoum that is still functioning today. Its history goes back to the second half of the fifth century CE, when the first hermitages were built in the area (Godlewski, 2007: 173, 177; 2011: 138). These cemeteries were used as burial grounds for lay individuals (Godlewski, 2011: 139). However, textiles identified at Cemetery A, in the cases of two graves, may indicate that members of the clergy were also buried there (Godlewski, 2011: 141).

These two cemeteries feature two different burial types. People buried in the Late Antique Cemetery C were laid in graves cut into the bedrock that forms a flat area between the desert hills of Naqlun and the fertile land below. Two such kinds of structures were discovered: simple pit graves and chamber tombs, in which bodies were taken down a vertical shaft into the low horizontal burial chamber. Most graves at Cemetery C were between 1 and 1.5 m deep (Zych, 2008: 234–235; Godlewski & Czaja-Szewczak, 2008: 249; Godlewski, 2005: 185). The deceased were wrapped in more than a dozen shrouds, tied using colourful linen strips. *Jarids* (palm leaf axes) and textile fillings were placed between the layers of the shrouds to strengthen the wrappings and give them their desired shape. They took the shape of a horizontal L, when viewed from the side, with the longer line being the body and the shorter one a protective head piece projecting over the face of the deceased (Fig. 6.2). The form of these burials can be seen as being something between the mummies of the Pharaonic period, with their intricate cartonnages, and the plain shrouded inhumations of Medieval times. In the fifth–sixth centuries CE, actual mummification was abandoned; therefore bandages were no longer in use and the deceased were buried wearing clothes and wrapped in shrouds.

The shrouds used to create the wrappings were comprised of a group of funerary textiles that used the same weave, utilized yarn of the same kind and thickness, and were decorated with similar colourful bands made of wool. Subsequent layers of shrouds were tied with colourful plaited linen strips. The last layer was formed of densely laid strips that served at least three purposes: they decorated the entire bundle, tied the shrouds, and protected them from the outside.

For the greater part of their existence, the only source of humidity in the graves cut into the bedrock in the desert were the bodies of the inhumed. Therefore, the clothing and shrouds that were in direct contact with the deceased were at the



**Fig. 6.1** Naqlun archaeological site featuring two cemeteries, C and A, and the remains of old and new monastery buildings. (PCMA archive, W. Małkowski)

greatest risk of decay, and the outer layers of the shrouds were frequently well preserved. This was not the case in the graves that had been disturbed by robbers where, besides damage caused by humidity, the textiles—the outer layer included—were



**Fig. 6.2** Typical burial from Cemetery C at Naqlun photographed from outside the grave. The wooden boards visible under the bundle were used by the excavators for transportation only and were not part of the original burial. (PCMA archive, W. Godlewski)

torn and commingled and, sometimes, bore signs of having been cut with a sharp tool.

At Medieval Cemetery A, most bodies were buried in coffins (Fig. 6.3). Some of these were made of palm leaf axes in the form of an openwork crate, a bier, or simple mats made with long palm leaf axes laid side by side and tied together. Such mats protected the bodies by wrapping them. The most numerous groups of coffins were in the form of boxes made of wood or palm-wood boards, rectangular or wedge-shaped, with either flat or gabled covers (Zych, 2005: 211–212). Many bodies were also buried directly in the sand with no coffin or any other container to protect them.

In Cemetery A at Naqlun, linen shrouds were used in every burial. The shrouds were used to cover the coffins and to wrap the deceased. They were used to protect the body regardless of whether it was buried in a coffin, placed on a bier, or buried directly in the sand. The deceased were dressed either in everyday casual clothes (Czaja-Szewczak, 2005a, b) with evident signs of wear, or in funerary garments (Czaja-Szewczak, 2003, 2011). These were of a very simple cut, sewn together using a basting stitch, with unfinished edges.

The preservation of textiles at Medieval Cemetery A depended both on the type of container with which the body was protected and the grave placement. The textiles, as well as the bodies, in the coffins buried in the small openings between the walls of the ruins of the old monastery buildings were particularly at risk of decay. In these places, air circulation was minimal leading to the accumulation of moisture. In contrast, the textiles in coffins made of palm leaf axes were desiccated. Although very dirty, these textiles were in a far better state of preservation. They were not exposed for long to the body's decomposition fluids owing to their direct contact



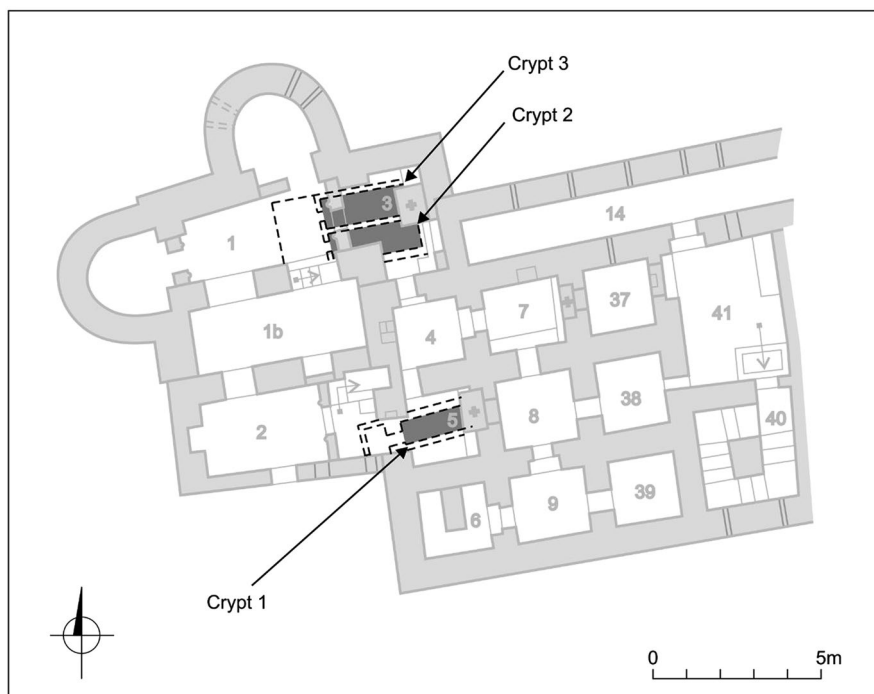
**Fig. 6.3** Cemetery A at Naqlun during excavation. Coffins already investigated are visible on the surface near the excavation area. (PCMA archive, W. Godlewski)

with the dry desert sand and dust from the mud brick decay, called *sibāh* (سياح) in Arabic, that also readily absorbs humidity. The best-preserved textiles were recovered from solid wood coffins buried in places that allowed the unimpeded circulation of air. The cover of the coffin, if closed tight, protected the textiles from being crushed by the sand.

The funerary crypts from the Medieval monastery on Kom H at Old Dongola, Sudan, posed a very different set of problems. In the commemorative complex of the Northwest Annex of this monastery, there are three crypts (Fig. 6.4), discovered in the 1990s (Jakobielski, 1993, 1994: 118–122; 1995; Żurawski, 1996, 1999), hosting most probably burials of the high-ranking church officials of Makuria (Żurawski, 1999: 222, 234; Godlewski, 2013: 87) or important monks from the monastery. The inside of Crypt 1 was comprehensively photographed at the time using an analogue camera. The researchers were careful not to disturb the burials and minimized damage when documenting the crypts archaeologically. However, by opening the crypts, they changed the microenvironment inside, which could have sped up the textiles' decay. Contemporary work in Crypts 2 and 3 was more invasive, but none of the three crypts of this commemorative complex were investigated in full until 2009. In 2009, Crypts 1 and 2 were fully investigated archaeologically, and in 2012 Crypt 3 too.

Crypts 1 and 2 each contained seven burials. The deceased wore everyday casual clothes and were wrapped in linen shrouds. The bodies were placed in layers separated by palm leaf mats (Godlewski et al., 2012). In Crypt 3, five individuals were





**Fig. 6.4** Plan of the commemorative complex of the Northwest Annex of the monastery on Kom H at Old Dongola with the location of the three funerary crypts. (Drawing W. Godlewski, M. Puzkarski, updated S. Maślak; after Jakobielski, Scholz 2001)

buried. Their clothing, except for one shroud, could not be identified due to the poor preservation of the textiles (Mahler et al., 2015: 355–360). Raised levels of humidity inside Crypt 3 at some point in its existence (Żurawski, 1999: 233; Mahler et al., 2015: 355–356), while not actually destroying the textiles, contributed to the rapid disintegration of organic fibres.

It is likely that the first individual buried in the commemorative complex was Archbishop Georgios. We know about him from the stela that decorates the wall next to the shaft leading to Crypt 1. He died in 1113 CE at the age of 82 (Jakobielski, 1994: 118–120; Łajtar, 2002). The walls of this crypt, we attribute to him, were plastered, whitewashed, and covered densely with inscriptions (Łajtar & Van der Vliet, 2012; Łajtar & Van der Vliet, 2017).

All the textiles and clothing accessories in Crypt 1 were badly preserved. The accumulation of moisture from the decomposing bodies in a small tightly closed vault, and direct contact with the decomposing burials, caused the textiles to decay almost entirely. All of them changed to a dark-brown colour and some developed black spots. The decay of the thread structure was so extensive that the textiles disintegrated when touched. All the layers of clothing on the bodies were stuck together, and in many cases their separation proved impossible. None of the textiles from

Crypt 1 were in sufficiently good condition to attempt conservation or any other kind of preservation treatment. These textiles were found to be infected microbiologically. Therefore, all of them were put back after being described in detail and photographed, and are stored inside the crypts of the commemorative complex. Unfortunately, the microbiological activity observed has sped up their current decay.

There were considerably fewer preserved textiles in Crypt 2 than in Crypt 1. During investigation inside we found three fragments of silk cloth decorated with gold thread (Fig. 6.5). These fragments most probably originated from the same piece of fabric. Two fragments were found in the middle of the ribcage of individual I, on top of it. These textiles could not have belonged to individual I. The silk shroud wrapping his body was undisturbed. The third fragment was found between individuals IV and VI on top of a small pile of sand build up in the middle of the northern wall of the vault. The location of these fragments proves that they were moved from their original position within the grave.

The decoration of the textile with gold thread was not entirely readable because of the dirt covering the fabric. However, even before cleaning and conservation work it was possible to determine its provenance. It belongs to a group of *tiraz* fabrics produced in the twelfth century and was, most probably, manufactured in Egypt. This textile was found stiff. Its fibres were desiccated and brittle. In this case, it was deemed impossible to undertake the cleaning and conservation *on site*. Therefore, based on an agreement with the authorities of Sudan, the textile was taken for treatment to a laboratory in Poland (Czaja, 2018).

The only other well-preserved textile was the shroud in which individual I was wrapped. It was no less than 2 m long, with the original colours clearly visible. The condition in which this textile was found ensured the successful recovery of its fragments was possible if carefully handled. Nevertheless, the fibres were brittle, calling for conservation work that would strengthen them and protect the recovered fragments from further damage. This textile would not have survived without proper treatment in a laboratory. To ensure the best treatment, the cloth was taken to Poland together with the one with gold thread.

### 6.3 Investigation of the Textiles

The way the textiles were excavated, hence the way they were protected during the early stages of our work, depended heavily on the type of burial. The investigation of graves at Late Antique Cemetery C at Naqlun followed a well-defined protocol. First, all the sand possible was removed from the burial chamber to make way for the easy removal of the body (or bodies) in wrappings. Then the entire burial, without unwrapping it, was transferred to the field laboratory. There, it was decided whether to further examine the burial or to simply document it from the outside. The best-preserved burials were left unwrapped and were stored in an on-site storage facility. When we decided to unwrap a burial, all further steps were meticulously documented. Particular attention was paid to technical details such as the materials





**Fig. 6.5** The 'golden textile' from a burial in the monastery on Kom H at Dongola; a: before and b: after conservation. (PCMA archive, B. Czaja)

used, the way they were used, their function, and placement. Standard elements encountered and described were: the decoration, shrouds, linen strip bindings, fillings, and other elements used to stiffen and give the desired shape to the entire wrapping. Unwrapped textiles were sorted by layer.

The final stages of unwrapping burials were undertaken in close cooperation with a human osteologist. The bones of the inhumed were carefully removed, and every effort was made not to damage either the textiles or the bones in the process. If the deceased or a part of their body had spontaneously (naturally) mummified, it was sometimes very difficult or impossible to remove the textile without causing damage to its structure. In such cases, after careful analysis of a particular case, the decision of what to do and how to do it was reached by the textile specialist and bioarchaeologist together.

The investigation of the burials in Cemetery A at Naqlun was very different. The burials excavated there were examined either *in situ*, if the coffin was absent or badly damaged, or on the surface near the area of excavation, if the coffin was present. Investigation *in situ* (Fig. 6.6) was more difficult as a rule, because burials *in situ* were rarely accessible from all sides. If there was an intact coffin, it was easy to access its contents after it was lifted from the grave and put aside, outside the excavation area, with its cover removed. If the cover was damaged or had not been sealed tightly, the sand that had got inside was carefully removed from the burial with a brush or was blown away using a rubber bulb air blower. All possible information concerning the manner of the burial and its layout were noted before and at every stage of the examination when new features became visible. The bones and



**Fig. 6.6** Investigation of a burial in Cemetery A at Naqlun. (PCMA archive, W. Godlewski)

textiles were studied at the same time and sorted according to the needs of the participating specialists.

Some of the funerary textiles from Cemetery A came from disturbed contexts, sometimes commingled with other graves. These were sorted in order to detect fragments of the same piece of cloth. Of these, only textiles deemed important for further studies were taken into storage.

The funerary crypts at the monastery on Kom H at Old Dongola were very hard to investigate mostly due to their constricted space. This problem was especially pronounced when compared with the easy access to the burials at Naqlun. Crypt 1 was particularly difficult in this respect. A narrow vertical shaft under the floor, allowing access for one person only, led to an entrance that was even smaller. To gain access to the vault, it was necessary to twist one's body sideways otherwise the shoulders of the excavator would not fit through the narrow entrance (Fig. 6.7). The vault's interior measured 2.06 m by 0.80 m only, but most of the space was taken up by burials (Godlewski et al., 2012). There was only about a 0.30 m wide strip of unoccupied space at the entrance—barely enough for one person to put their feet inside. The low, steeply vaulted ceiling, 1.40 m high, forced the excavator to perform their work while crouching. The walls of the vault were covered with invaluable inscriptions (Fig. 6.8) that could have been destroyed if touched (Łajtar & Van der Vliet, 2012; Łajtar & Van der Vliet, 2017). Therefore, the investigation inside the crypt was even more difficult as touching the surrounding walls was not an



**Fig. 6.7** Entering Crypt 1 in the monastery at Old Dongola required twisting one's body sideways. (PCMA archive, B. Czaja)





**Fig. 6.8** Crypt 1 in the monastery at Old Dongola before investigation. (PCMA archive, R. Mahler)

option, let alone leaning against them for support. In consequence the excavator could barely move inside the vault, and the investigation had to proceed in stages (Fig. 6.9) that addressed most burials in two separate halves.

The extent of each stage of the study was limited by the reach of the excavator's arms. However, it proved possible to conduct the investigation in only three general steps. First, the five topmost burials were examined down to the pelvic girdle, then, during the subsequent step, the pelvis, hands, and legs of these five individuals were studied at the same time. In the third step, individuals V and VII were examined. These burials, the lowermost, were found embedded in a mixture of mud and sand. They were cemented in by moisture which had probably come from the decomposition fluids of all seven burials. The clothing and shrouds of individuals V and VII were therefore the least well preserved.

Textiles from this crypt were poorly preserved in general. Therefore, they could only be separated after the investigation, when taken to the field laboratory. To avoid



**Fig. 6.9** The investigation of burials in Crypt 1 in the monastery at Old Dongola proceeded in stages. (PCMA archive, B. Czaja)

further damage and to compensate for the problem of their subsequent identification after separation from the burial, they were taken outside together with the bones they wrapped; this way, a sleeve was taken out with the bones of the arm, and a skull, when removed, may have retained the remains of a shroud on it.

The restricted size of the vault, coupled with the small entrance, severely limited air flow, thus calling for temperature and humidity to be monitored during the investigation. The first measurements were taken each day before work. Subsequent measurements were taken every hour. A rapid change in the humidity and air temperature could have caused the rapid growth of microorganisms which were otherwise inactive or whose activity was low. A rapid increase in the activity of microorganisms constitutes a potential health risk for the excavator and can cause additional damage to the textiles, hence the monitoring. Our fears concerning the conditions inside the crypts were, however, allayed when we discovered that after a steep increase in both temperature and relative humidity, the conditions stabilized, reaching levels that we deemed safe from the point of view of both the excavator and preservation of the textiles. For example, during the first hour of work in Crypt 2, the temperature increased from 24 °C to 24.6 °C and the humidity from 10 per cent to 37 per cent. After the second hour had passed, the temperature reached 25.5 °C but the humidity had dropped to 36 per cent. Another hour brought another increase in temperature to 27 °C and a small drop in humidity to 34 per cent.

The relatively low and stable humidity allowed us to work fast, without the need of time-consuming breaks that would have otherwise been necessary to improve the conditions inside. It is agreed in general that high humidity, relative humidity (RH) of more than 50–60 per cent depending on the source, and a lack of air circulation can accelerate the growth of fungi and other organisms that could be harmful to the fabrics. On the other hand, humidity below 35 per cent coupled with high temperatures can make the textiles more brittle (Gutarowska et al., 2017: 2390–2391). We believe that the weather helped us in our work. Early spring of 2009 at Old Dongola was exceptionally hot, and the high temperature outside the monastery with a RH of 12 per cent could have kept the humidity increase caused by the excavator working in the crypt at bay.

The investigation was conducted by an anthropologist and a textile specialist, both also archaeologists. Reasonable measures were taken to ensure our safety during excavation and after the material was removed from the crypt. When investigating, sorting, and during the first stages of documenting the textiles and human remains we wore safety overalls, anti-dust goggles, an FFP3 type disposable mask, and two pairs of gloves. Of those gloves, the first pair was made of cotton and ensured comfort. The second was made of latex or vinyl for protection against dirt and microorganisms. Sometimes, if the dust in the air during the examination became particularly thick, we wore an additional medical mask over the FFP3 one.

The most demanding conditions were in Crypt 1. The remaining crypts, 2 and 3, were more spacious inside. Moreover, their walls were neither whitewashed nor covered with inscriptions, hence they allowed relative freedom of movement and positioning during work. This enabled us to study the burials one by one, without dividing the examination into stages. It was fortunate we had the possibility to do our work in this way, as in the case of Crypt 2 some of the burials were disturbed. Reconstructing the original position of the burials required easy access to them. Paradoxically, this was further facilitated by the poor preservation of the textiles. Only two were preserved in Crypt 2 and these were studied first. The textiles in Crypt 3 were the least well preserved. Only small textile fragments were recovered from this crypt, enabling the original size of only one of them to be ascertained (Mahler et al., 2015).

## **6.4 Textiles Studied—Preventive Treatment and Conservation**

After excavation, textiles have to be cleaned and protected from further damage. At the time, it was very difficult to carry out conservation at Naqlun. There was not always cold tap water available, and if hot water was needed it had to be boiled. Moreover, sometimes there were power outages. The rooms of the old monastery buildings that were made available to us were full of dust that blew in from the desert due to a draughty roof, door, and windows. Undertaking conservation work at

Old Dongola was even more difficult as there was no tap water there at all, and the power was on only in the evenings.

All textiles were disinfected immediately after excavation with an ethanol solution of Lichenicida 264 (Bresciani). The biocide was applied with a sprinkler. The concentration of the solution was determined by the conservator depending on the condition of the fabric. Then, they were dry-cleaned and, if the state of preservation allowed, were subsequently cleaned in water. After wet-cleaning, the textiles were left to dry in the air then smoothed out with a precision-heated spatula with a temperature control. Following this, photographic documentation and descriptions were prepared, and the textiles were put in acid-free paper envelopes and stored in a trunk in an on-site storage facility.

The huge number of textiles excavated made it impossible to carry out full conservation of all of them. A month and a half of work added approximately 100 new pieces to the total every excavation season. Therefore, conservation work had to be spread out over time. Before almost every excavation season, textiles in the storage facility were selected for conservation (Figs. 6.10 and 6.11). The main criteria were



**Fig. 6.10** Shawl (Nd.02.245) from Cemetery A at Naqlun after conservation. (PCMA archive, B. Czaja)





**Fig. 6.11** Decorative fragment of a shawl (Nd.02.245; silk, linen); Naqlun, Cemetery A. (PCMA archive, B. Czaja)

their state of preservation and value, whether scientific, aesthetic, or other. At Naqlun, full conservation was possible in the case of six textiles (Czaja-Szewczak, 2002, 2004, 2010).

The most important textiles from the crypts in the commemorative complex on Kom H at Old Dongola were conserved in a laboratory in Poland. At that time, similar treatment would not have been possible at the site and would have posed a danger to the textiles. It is generally agreed that the main aim of conservation work is to preserve the authenticity of the textile. Textile conservators, and conservators in general, must adhere to a code of conservation ethics. Archaeological fabrics are protected to stop the destruction process. However, this itself is evidence of the past and a conservator must not threaten the authenticity of the textile by doing more than is absolutely necessary in every single case. There can be no reconstructions or filling in. Non-existent fragments of archaeological fabrics should not be supplemented by imitating the weave of the original.

Human remains from the cemeteries at Naqlun are stored on site. Those from the commemorative complex of the monastery on Kom H at Old Dongola were put inside empty funerary crypts. Storing skeletal material in an *on site* storage space or in the original tomb ensures that the exhumed individuals are not removed far from the original context of their graves, while their remains are readily available for further studies.

## 6.5 Archaeometry

The most pronounced difference between research at Naqlun and at Old Dongola could not be attributed, however, to the conditions *on site*. The possibility to conduct archaeometric studies using archaeological material in Egypt is very limited due to the restrictions imposed by the administration. Some analyses can be undertaken but only in laboratories certified directly by the service of antiquities. Moreover, any analysis or treatment to be carried out off-site is difficult to organize and very costly to perform. At the same time, the consent to conduct analyses or treatment in a laboratory outside of Egypt is almost impossible to acquire. The only more or less safe alternative is to do as much as possible on site. On the one hand this certainly limits research options, but on the other hand it makes us creatively look for ways to apply an ever wider variety of on-site analyses and treatments.

Currently, Sudan is at war and it is not possible to perform any archaeological research there. Before the war, however, the National Corporation of Antiquities and Museums (NCAM) of Sudan allowed researchers to take samples and study them abroad. It was also possible to get permission to take selected artefacts abroad and perform complex conservation treatments in the facility of choice. There were also some efforts under way that aimed to open archaeological research facilities in Khartoum.

We hope that in the near future the war in Sudan will end, and people living there will no longer suffer as they do now. This would give us the opportunity to continue our research there. This is all the more important now as the rapid advancement in the variety and availability of archaeometric methods can barely be utilized in connection with our work in Egypt. We can certainly hope for more on-site analyses and laboratory procedures to be made available in Egypt in the immediate future, but in the long run the restrictions in effect will not allow us to keep up with the newest advancements in archaeometry offered—in particular—by laboratories in Europe and the United States of America.

## 6.6 Conclusions

Several excavation seasons of joint work in two completely different settings has taught us the importance of good cooperation between textile and human bone specialists. Thanks to this close cooperation and to the fact that, despite having different specializations, we both come from the same archaeological background, we were able to obtain the information deemed important for a wide variety of aspects of funerary studies. We achieved this without compromising each other's work. Therefore, careful investigation of human bones does not necessarily mean the destruction of textiles or textile-connected evidence and vice versa. The same applies to the rest of the evidence collected.

We have both greatly benefited from our cooperation as did, in our opinion, the bulk of the evidence we were able to collect. This became especially visible during the excavation of the crypts at the commemorative complex of the monastery on Kom H at Old Dongola. At Naqlun, we investigated together and could discuss what to do next on the fly. This was not possible at Old Dongola because of the small size of the vaults.

Such close cooperation as we have been able to achieve has allowed us to combine our fields of expertise to produce new high-quality results. We have not yet had the opportunity to present the full potential of our work together so far, but we hope to prove the point when the final results of our work in Cemetery A at Naqlun are published.

**Acknowledgements** We would like to express our sincerest gratitude to the people who allowed us to do our work and helped us along the process. To Włodzimierz Godlewski, the former head of the expeditions to Naqlun and Old Dongola who invited us to do our research there. To Karol Piasecki, the anthropologist who supervised the work of Robert Mahler at Naqlun back in the first years of the twenty-first century and worked hand in hand with Barbara Czaja. To Anne-Marie Fabianowska, who made our English more readable. To the anonymous reviewers for their kind remarks and comments. To the employees of the Supreme Council of Antiquities of Egypt and National Corporation of Antiquities and Museums of Sudan, for their support at every stage of our work in the field. To Magdalena M. Woźniak and Elsa Yvanez, who kindly invited us to share our experiences in the current volume. And last but not least, to all others to whom we could not give our thanks directly because there are too many of them.

## References

- Czaja, B. (2018). The “golden textile” from a burial in the monastery on Kom H in Dongola: conservation and restoration. In W. Godlewski, D. Dzierzbicka, & A. Łajtar (Eds.), *Dongola 2015–2016. Fieldwork, conservation and site management* (pp. 67–74). University of Warsaw Press.
- Czaja-Szewczak, B. (2000). Textiles from Naqlun, 1999. In *Polish Archaeology in the Mediterranean 11 (Reports 1999)* (pp. 135–142).
- Czaja-Szewczak, B. (2002). Textiles conservation, 2001. In *Polish Archaeology in the Mediterranean 13 (Reports 2001)* (pp. 178–184).
- Czaja-Szewczak, B. (2003). Burial Tunics from Naqlun. In *Polish Archaeology in the Mediterranean 14 (Reports 2002)* (pp. 177–184).
- Czaja-Szewczak, B. (2004). Naqlun 2003. From scraps to tunic. In *Polish Archaeology in the Mediterranean 15 (Reports 2003)* (pp. 159–164).
- Czaja-Szewczak, B. (2005a). Tunics from Naqlun. In G. Gabra (Ed.), *Christianity and Monasticism in the Fayoum Oasis. Essays from the 2004 International Symposium of Saint Mark Foundation and the Saint Sheunuda the Archimandrite Coptic Society in Honor of Martin Krause* (pp. 133–142). Cairo/New York.
- Czaja-Szewczak, B. (2005b). Textiles from Naqlun, 2004. In *Polish Archaeology in the Mediterranean 16 (Reports 2004)* (pp. 203–210).
- Czaja-Szewczak, B. (2010). Conservation of a Fatimid Shawl from the Naqlun Cemetery. In *Polish Archaeology in the Mediterranean 19 (Reports 2007)* (pp. 248–250).
- Czaja-Szewczak B (2011). Funerary textiles from the medieval cemetery of Naqlun. In *Archaeology in the Mediterranean 20 (Research 2008)* (pp. 413–420).

- Godlewski, W. (2005). Naqlun (Nekluni): Season 2004. In *Polish Archaeology in the Mediterranean 16 (Reports 2004)* (pp. 181–190).
- Godlewski, W. (2007). Naqlun. In E. Laskowska-Kusztal (Ed.), *Seventy Years of Polish Archaeology in Egypt* (pp. 171–182). University of Warsaw.
- Godlewski, W. (2011). Naqlun Cemeteries. In G. A. Belova (Ed.), *Achievements and Problems of the Modern Egyptology. Proceedings of the International Conference Held in Moscow on September 29–October 2, 2009* (pp. 138–151). Russian Academy of Sciences, Center for Egyptological Studies.
- Godlewski, W. (2013). *Dongola – Ancient Tungul. Archaeological guide*. Polish Centre of Mediterranean Archaeology.
- Godlewski, W., & Czaja-Szewczak, B. (2008). Cemetery C.1 in Naqlun Tomb C.T.5 and its Cartonnages. In *Polish Archaeology in the Mediterranean 18 (Reports 2006)* (pp. 247–260).
- Godlewski, W., Mahler, R., & Czaja-Szewczak, B. (2012). Crypts 1 and 2 in the Northwest Annex of the Monastery on Kom H in Dongola: Report on the exploration in 2009. In *Polish Archaeology in the Mediterranean 21 (Reports 2009)* (pp. 338–360).
- Gutarowska, B., Pietrzak, K., Machnowski, W., & Milczarek, J. M. (2017). Historical textiles – A review of microbial deterioration analysis and disinfection methods. *Textile Research Journal*, 87(19), 2388–2406.
- Jakobielski, S. (1993). Old Dongola, 1991–1992. *Polish Archaeology in the Mediterranean 4 (Reports 1992)* (pp. 98–110).
- Jakobielski, S. (1994). Old Dongola 1993. In *Polish Archaeology in the Mediterranean 5 (Reports 1993)* (pp. 115–128).
- Jakobielski, S. (1995). Old Dongola 93/94. In *Polish Archaeology in the Mediterranean 6 (Reports 1994)* (pp. 84–92).
- Łajtar, A. (2002). Georgios, Archbishop of Dongola († 1113) and his epitaph. In T. Derda, J. Urbanik, & M. Węcowski (Eds.), *Euergesias Charin. Studies presented to Benedetto Bravo and Ewa Wipszycka by their disciples* (pp. 159–192). Fundacja im. Rafała Taubenschlaga.
- Łajtar, A., & Van der Vliet, J. (2012). Wall inscriptions in a burial vault under the Northwest Annex of the monastery on Kom H (Dongola 2009). *Polish Archaeology in the Mediterranean*, 21, 316–323.
- Łajtar, A., & Van der Vliet, J. (2017). *Empowering the dead in Christian Nubia: the texts from a medieval funerary complex in Dongola*. *Journal of Juristic Papyrology*.
- Mahler, R., Godlewski, W., Danys-Lasek, K., & Czaja, B. (2015). Crypt 3 in the Northwest Annex of the Monastery on Kom H in Dongola: report on the exploration in 2012. *Polish Archaeology in the Mediterranean*, 24(1), 352–367.
- Żurawski, B. (1996). Old Dongola Cemeteries 1995. In *Polish Archaeology in the Mediterranean 7 (Reports 1995)* (pp. 121–135).
- Żurawski, B. (1999). The Monastery on Kom H in Old Dongola. The monks' graves. A preliminary report. *Nubica et aethiopica*, 4(5), 201–253.
- Zych, I. (2005). Wooden Coffins from Cemetery A in Naqlun. In *Polish Archaeology in the Mediterranean 16 (Reports 2004)* (pp. 121–221).
- Zych, I. (2008). Cemetery C in Naqlun: Preliminary report on the excavation in 2006. In *Polish Archaeology in the Mediterranean 18 (Reports 2006)* (pp. 230–246).

**Barbara Czaja** is a graduate of Mediterranean Archaeology at the University of Warsaw. She completed her postgraduate studies in Modern Analytical Techniques in the Conservation of Artworks at the Faculty of Chemistry of the Jagiellonian University and Museology at the University of Warsaw. Now an art conservator at the Museum of King Jan III's Palace in Wilanów, she organizes the conservation regime for the care of the Museum's textile collection and conducts multi- and interdisciplinary studies of the fabrics. Her research interests mainly focus on antique oriental fabrics, and archaeological textiles and dress from the Nile Valley.

**Robert Mahler** is a bioarchaeologist and archaeologist focused on the archaeology of death with wide experience in fieldwork in Egypt and Sudan. His PhD was on the medieval Muslim cemetery at Kom el-Dikka. Mahler runs a project investigating the well-being of women in Egyptian Alexandria under the Fatimids.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



## Chapter 7

# Grave Concerns: The Complexity of Recovery, Documentation, and the Study of Funerary Textiles from Ancient Egyptian Inhumations at Saqqara



Iwona Kozieradzka-Ogunmakin

**Abstract** Ancient Egyptians were renowned textile manufacturers and users, as evident in art and funerary contexts. Linen was used extensively during mummification and body preparation for burial, resulting in rich artefactual assemblages preserved by the dry and hot climate of the Nile Valley, as seen in a multi-period cemetery at Saqqara. Inhumations from the late Old Kingdom/First Intermediate Period and Graeco-Roman Period contain linen textiles for a variety of uses; from body fillers and padding to mummy wrappings and coffin linings. Similar to portable goods, the varying quality and quantities of the textiles used in individual burials can serve as an indicator of personal/family wealth and social standing of the deceased. Methodical examination and recording of the pattern of linen application and external decoration can reveal temporal and spatial trends and traditions in body treatment. Using the Saqqara case studies, this paper aims to demonstrate the complexity of recovery, documentation, and the study of textiles from ancient Egyptian burial contexts, and to emphasize the need for a field textile recording protocol to standardize archaeological practices moving forward.

**Keywords** Ancient Egypt · Saqqara · Human mummies · Mummification · Burials · Funerary textiles · Funerary wealth index

## 7.1 Introduction

The climate and environmental conditions in the ancient Nile Valley were conducive to flax cultivation, the plant that was commonly and extensively harnessed for making linen for both the living and the dead (DeYoung, 2014; Hall, 1986; Ikram & Dodson, 1998; Karg et al., 2023; Melelli et al., 2021; Vogelsang-Eastwood, 1992,

---

I. Kozieradzka-Ogunmakin (✉)

Polish Centre of Mediterranean Archaeology, University of Warsaw, Warsaw, Poland

© The Author(s) 2025

E. Yvanez, M. M. Wozniak (eds.), *Funerary Textiles in Situ*, Interdisciplinary Contributions to Archaeology, [https://doi.org/10.1007/978-3-031-69461-5\\_7](https://doi.org/10.1007/978-3-031-69461-5_7)

137



1993, 2000). The same hot and dry climate allowed for exceptional preservation of textiles and other organic remains in archaeological contexts. Textiles featured prominently in ancient Egyptian funerary and religious practices, as attested by well-preserved mummified human and animal remains, and votive offerings (e.g. Riggs, 2014; McKnight & Atherton-Woolham, 2015). In those contexts, textiles were used with the intention to protect the body and conceal the object; thus, they played a highly significant role in the mummification process, and mortuary and religious rituals (Riggs, 2014: 23).

The lack of understanding of the intended role and significance of the textiles used as object or body wrappings in the early days of Egyptian archaeology often resulted in their careless removal and unceremonious disposal, for it was the contents and not the wrappings that were deemed research-worthy and, thus, of interest to the viewer and scholarship. An infamous example of such practice was mummy unrolling, often turned into public spectacles in Britain in the mid-nineteenth and early twentieth centuries (Moshenska, 2014), to autopsy the mummified body, which was the main object of public and scientific fascination, and to recover pieces of jewellery and amulets that were expected to be found on the body or between the wrappings. In those cases, the interest in the wrappings was negligible and largely limited to superficial observations of the arrangement of the outermost layers at best. The unwrapping would be carried out by medical professionals, often surgeons like Thomas Joseph Pettigrew (1791–1865), whose focus was almost entirely on the examination of the body, whilst the interest of an assisting Egyptologist would mostly lie in the recovered objects. No one displayed any interest in long strips of wrappings, discoloured by time, resin, and bodily fluids. In a way, these practices set a precedent for a division of roles and responsibilities in the study of ancient Egyptian mummified human remains that continued throughout the twentieth century, until the field of bioarchaeology had been firmly established. Still, the awareness of the importance of *in situ* recording and documenting funerary textiles, including mummy wrappings, and their research potential remain rudimentary across the archaeological body. Commonly, *in situ* textile recording proves to be very much intuitive, largely guided by archaeological methodology and understanding of context, stratigraphy, and naked-eye observation. To date, there are no standardized protocols and guidelines for recording ancient Egyptian funerary textiles in the field setting (i.e. prior to specialist studies), and the on-site presence of a textile specialist remains rare.

Sir William Matthew Flinders Petrie (1853–1942), a prominent figure in Egyptian archaeology, was a pioneer of systematic methodology and preservation of artefacts, including textiles. The notes taken during his excavation work at a Roman-Period cemetery at Hawara in 1888 reveal not only his methodology for dealing with the funerary textiles, but also the technical knowledge of the fabric that he possessed (Petrie, 1911: 16–18). The unwrapping of several mummies conducted at Hawara was recorded step by step, the linen strips were counted, and samples of nearly all the individual strips were taken. Interestingly, Petrie also noted that some strips were very similar and likely came from the same piece of cloth. He further remarked that the quantity of linen used explained the heavy weight and bulkiness

of the mummies, and noted that the unwrapping and recording of the textiles took half a day and involved two to three observers.

At the time when linen was generally overlooked as an artefact and discarded by archaeologists, Petrie persisted in methodically recording and collecting linen. Thanks to his diligence, the earliest-known example of ancient Egyptian dress recovered from a looted tomb (Mastaba 2050) at Tarkhan has been preserved. Upon discovery in 1913, however, it was a very unassuming linen bundle that could have been easily discarded. Yet, Petrie collected the bundle and sent it to London where, somewhat surprisingly, it remained intact and forgotten until 1977. Since its re-discovery in the museum's storage facilities, the dress—dated to the 1st dynasty (3100–2900 BCE)—has undergone an extensive conservation and study programme (Landi & Hall, 1979; Johnstone, 2015), and is now on display at the Petrie Museum of Egyptian Archaeology (UC28614B1).

Over a hundred years on, these two examples—the practice of recording mummy wrappings and the preservation of a linen bundle-turned-dress—stand as a reminder of the importance of a comprehensive and methodical approach when recording, and the necessity of collaborative and interdisciplinary work between specialists, as recently implemented at the ancient cemetery at Dahshur (Cortes, 2012), located south of Saqqara. Owing to the climatic and environmental conditions of the Nile Valley, the preservation of archaeological remains in Egypt is exceptional, and that extends to textiles, which often account for one of the most frequently encountered—but not always properly recorded—artefacts in funerary contexts. It is, therefore, regrettable that this category of artefacts remains largely marginalized and understudied. The lack of standardized protocols and guidance to assist with *in situ* recording, documentation, and storage of textiles from funerary contexts in the field setting is an increasingly growing concern for non-textile specialists working directly with interments. This paper will use the cemetery at Saqqara—part of the ancient Memphite necropolis—as a case study to demonstrate the wealth, variety, and diversity of the preserved textile remains in ancient Egyptian funerary contexts, and the complexity of their on-site recording and documentation prior to specialist studies. It will also strongly advocate for open and closer collaborations between various specialisms and sub-disciplines to enable a better understanding of ancient Egyptian life and death through a holistic approach to material culture and human remains.

## 7.2 Ancient Memphite Necropolis at Saqqara: A Case Study

The ancient city of Memphis, established at the apex of the Nile Delta (Fig. 7.1), had been an important administrative and religious centre for millennia, and the capital of the unified Ancient Egyptian state during the Old Kingdom (c. 2686–2181 BCE). Following a temporary decline during the New Kingdom (c. 1550–1069 BCE), Memphis became the second most important city in Egypt, after Alexandria, during the Graeco-Roman Period (332 BCE–395 CE), and remained so



**Fig. 7.1** Map of Egypt with location of ancient Memphis and Saqqara

until the establishment of el-Fustat (Old Cairo), the first capital of Egypt under Arab rule, in 641 CE (Jeffreys, 1999). Both the location and the growing prominence and prosperity of the city were attractive to many settlers who steadily contributed to the growth of the city's population over time, cautiously estimated to have been around 6000 inhabitants during the Old Kingdom (Bard, 1999: 250), making Memphis one of the most populous ancient cities at the time. During the Graeco-Roman Period, the population of Memphis is speculatively estimated to have ranged from 50,000 to 200,000 (Thompson, 1988: 32–38).

Over the span of several millennia, numerous cemeteries were established to accommodate burials of the socially diverse and growing population of Memphis and its satellite settlements. Early Dynastic (c. 3150–2686 BCE) and Old Kingdom (c. 2686–2181 BCE) royal and elite cemeteries were in prominent locations to the west of the city, known today as Giza, Abusir, Saqqara, and Dahshur (Fig. 7.1).

These and several other cemeteries are collectively known as the Memphis necropolis, which stretched for 30 km north–south along the Nile, from Abu Rowash to Meidum. Over time, many of the elite cemeteries, like Saqqara, were used for burials of the non-elite population, particularly during Graeco-Roman and Byzantine times (332 BCE–640 CE).

### **7.2.1 *The Saqqara Necropolis***

The Saqqara necropolis is located on the desert plateau immediately to the west of the present-day village of Saqqara, some 30 km south of the capital city of Cairo (Fig. 7.1). Bordered by the Abusir necropolis to the north and the Dahshur necropolis to the south, this ancient burial site stretches over 6 km north–south and 1.5 km east–west, forming the largest and one of the oldest parts of the Memphite necropolis (Bárta & Brůna, 2006). The earliest burials at Saqqara belonged to the elite of the Early Dynastic Period (Bard, 2003; Macramallah, 1940); these were later overshadowed by the construction of the funerary complex of Pharaoh Djoser (c. 2686–2648 BCE), the focal point of which was the so-called Step Pyramid, the earliest stone construction of such magnitude and form in Ancient Egypt.

The Step Pyramid remains the focal point of the entire necropolis and best preserved of the 17 royal pyramids known to have been constructed between the Old Kingdom and the Second Intermediate Period (c. 1650–1550 BCE) at Saqqara. Throughout the Pharaonic Period and beyond, private funerary monuments of high officials and non-elite burials were added; these often clustered around the monumental royal complexes, forming discrete cemeteries. One of these cemeteries (occasionally referred to as Saqqara West in the literature) was established immediately to the west of the Step Pyramid complex, and was extensively used during the late Old Kingdom (c. 2465–2181 BCE), the First Intermediate Period (c. 2181–2055 BCE), and again during Graeco-Roman times (Fig. 7.2). The cemetery was identified by a team of archaeologists from the University of Warsaw in 1984, and has been excavated since 1987 under the directorship of Professor Karol Myśliwiec (until 2016) and Dr. Kamil Kuraszkiewicz. The earliest burials (the lower stratum) form the so-called Lower Necropolis, whereas the later inhumations (the upper stratum) are referred to as the Upper Necropolis; the two terms were introduced to differentiate these temporally distinct phases of the funerary activity on site.

#### **7.2.1.1 Lower Necropolis—Late Old Kingdom/Early First Intermediate Period**

The so-called Lower Necropolis contains remains of the funerary architecture and burials of 5th- and 6th-dynasty high officials, including lavishly decorated and well-preserved funerary chapels of the vizier Merefnebef and the overseer Nyankhnefertem



**Fig. 7.2** Saqqara cemetery located to the west of the Step Pyramid complex. The Lower necropolis is represented by rock-hewn shafts; the Upper Necropolis is represented by pit-graves in sand and *dakka*

(Myśliwiec et al., 2004, 2010). There are also burials of lesser-ranked palace officials and lower-status individuals from the late Old Kingdom to Early First Intermediate Period (Kuraszkiewicz, 2013; Welc et al., 2013). The use of textiles, primarily as a body wrapping material, is evident in almost all those burials; however, its preservation varies significantly across the interments of this period. This is likely due to the individual post-mortem treatment of the body, the burial location and post-depositional conditions, and burial environment in general.

The elite inhumations took place in deep, underground, rock-hewn burial chambers, with the body placed in a stone sarcophagus or wooden coffin. In those instances, the human remains preserved well, but the same cannot be said for the funerary textiles, which could have been adversely affected by rainwater that accumulated in burial chambers following unusually heavy rainfalls recorded towards the end of the Old Kingdom (Welc & Marks, 2014; Trzeciński et al., 2010). Large-scale looting that took place in antiquity should also be counted among the factors that contributed to the poor preservation of funerary textiles in many of the burials. In contrast, later and poorer burials were less affected by both factors and, therefore, generally demonstrate significantly better preservation of funerary textiles. Unlike the elite burials, these were placed in small underground chambers and in *dakka*—a compacted deposit of sand and gravel that formed on top of the sandstone bedrock due to stone quarrying, weathering, and natural accumulation—which were porous and allowed the water to drain away quickly, aiding the preservation of both human

remains and textiles, as well as the reed coffins that the bodies were placed in. Due to the lower social status of the buried individuals, which would translate to fewer or poorer quality grave goods, those burials were less frequently targeted by looters in comparison to the elite burials; thus, they remained well preserved until modern times.

### 7.2.1.2 Upper Necropolis—Graeco-Roman Period

The funerary activity immediately to the west of the Step Pyramid ceased sometime during the First Intermediate Period, only to be resumed in that location some 2000 years later, towards the end of the Late Period, where it continued for another several hundred years throughout Graeco-Roman times. This so-called Upper Necropolis contains hundreds of simple inhumations of the Memphite non-elite, varying from niche burials, grave-pits dug into the bedrock or *dakka*, and sand interments with or without the use of wooden or reed coffins (Kaczmarek et al., 2008; Radomska et al., 2008). The material common to all those burials was funerary textiles, of which voluminous quantities and various qualities were often used as body wrappings or fillers. Linen had been extensively used in burial practices, especially during mummification and for body wrapping, particularly in late Pharaonic Egypt, the abundant evidence of which is to be found at Saqqara.

The post-mortem treatment of the body varied greatly during that period, from simple desiccation and wrapping, to complex procedures that involved the removal of internal organs, application of molten resin, filling of body cavities, remodelling to restore a lifelike appearance, and intricate and decorative body wrapping (see Myśliwiec et al., 2010; Radomska et al., 2008). Understandably, the use of linen grew proportionally with the complexity of the treatment provided. A combination of multiple factors, including the environmental and burial conditions, funerary practices, and a variety of purposes for the use of linen, as well as limited burial disturbance associated with looting, have contributed to the exceptional preservation of textiles in the funerary contexts of that time at the Saqqara necropolis. The ways in which textiles were used in such contexts during that period is notably more complex in comparison to the burials of the Lower Necropolis. It is this complexity of the application of linen, combined with its volume and diverse quality, as well as its state of preservation, that present a challenge for *in situ* documentation and the subsequent specialist study of the Saqqara burials, and those from the Upper Necropolis in particular.

### 7.2.2 The Funerary Textiles

As previously stated in this paper, the preservation of textiles in funerary contexts at Saqqara varied across the burials and time periods, from miniscule and fragile traces, to large sheets of cloth and swathes of mummy wrappings. A number of



inhumations appeared ‘naked’ to the human eye, with no visible traces of textiles that would have been used to wrap the body; however, in some of those cases, a closer examination of the burial has revealed indirect evidence of their original presence.

### 7.2.2.1 The State of Preservation

The dry and hot environment of Egypt has been conducive to the preservation of organic remains in burial contexts, including textiles. However, there are inhumations that lack any tangible evidence of their use; therefore, the presence of textiles in these burial contexts can only be assumed (e.g. through comparative material from a given cemetery or burial practices of the specific period), but not proven.

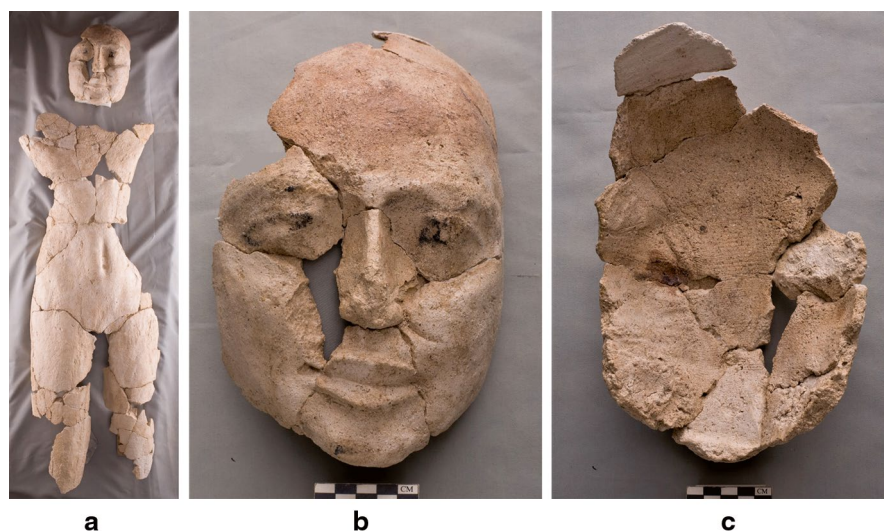
#### 7.2.2.1.1 Traceable but Not Tangible

A closer examination of several skeletonized burials from the Lower Necropolis has revealed indirect evidence of textiles in the form of imprints, left either in a silt deposit that accumulated in a burial pit or coffin, or on the inner side of plaster that covered parts or the entire front of the body. The first case can be illustrated by a child burial (B.652) uncovered at the bottom of a rock-hewn shaft (Fig. 7.3). The semi-flexed body, adorned with a beaded necklace, was placed on its right side in a wooden coffin; the child’s skeletonized remains showed no tangible evidence of body wrapping. Nevertheless, a closer inspection of the silt deposit that was carried in by rainwater and accumulated at the bottom of the coffin has revealed textile imprints, thus providing the missing evidence of their original presence in that burial context.

Similar and contemporaneous evidence for the use of textiles as body wrappings has been recorded in a looted and disarticulated skeletonized burial of an adult male (B.551), recovered from a rock-hewn burial chamber of a late Old Kingdom shaft tomb (Kaczmarek & Kozieradzka-Ogunmakin, 2013: 354; Kowalska et al., 2009). Imprints of linen strips that were used to wrap the body were found on the inner surface of a plaster mask that was moulded on the face and covered the front of the body of the deceased (Fig. 7.4). The imprints are clearly discernible, allowing for the width of the linen strips and quality of the fabric to be determined, thus adding to our knowledge of the application of textiles in burial practices and body treatment during the late Old Kingdom/Early First Intermediate Period in the Memphis region. The application of linen wrappings can be considered as a distinctive element of mummification and indicative of the practice (understood here as any intentional treatment of the body—invasive or non-invasive—to aid its preservation) during this period (e.g. Ikram et al., 2023, see Table 3).

**a****b**

**Fig. 7.3** Child burial B.652, Lower Necropolis (a). Note textile imprints in the silt deposit accumulated at the bottom of the coffin (b)



**Fig. 7.4** Burial 551, Lower Necropolis. The face and the front of the body were covered with gypsum plaster moulded to shape on the wrapped body (**a**, **b**). The inner surface of the plaster mask reveals textile imprints and the arrangement of the wrappings (**c**)

#### 7.2.2.1.2 Traces and Fragments

Post-mortem body treatment, burial conditions, and to some extent looting, have impacted the preservation of funerary textiles in a number of burials in both the Lower and Upper Necropoleis. For example, the use of body treatment agents, such as molten resin, which was applied directly onto the body and wrappings during the Graeco-Roman Period, had often the opposite of the desired effect on the preservation of the mummified body, and by extension the funerary textiles. In such cases, gradual deterioration and degradation of the fibres have left the wrappings extremely fragile and in a fragmentary state of preservation (Fig. 7.5). Consequently, the unstable condition of the wrappings impedes their layer-by-layer identification and makes their separation impossible.

#### 7.2.2.1.3 Fillers, Wrappings, and Fastenings

As the mummification process developed through time, so did the practice and technique of body wrapping, reaching its zenith of intricacy in Graeco-Roman times. Amongst the Lower Necropolis burials, there is clear evidence of the use of linen strips for body wrapping with added fastenings as a finishing or decorative element (Fig. 7.6). Linen strips were also used as fastenings to secure reed coffins, as shown in Fig. 7.7.

The Graeco-Roman-Period inhumations at the Upper Necropolis demonstrate an array of wrapping techniques, from a simple wraparound of the entire body in just a few layers of linen wrappings, to a multistage process that consisted of using linen on the body in several ways, during both mummification and preparation for burial.





**Fig. 7.5** Poor preservation of body wrappings affected by chemical reactions from embalming agents. Note blackened and fragile condition of the inner layers of wrappings; B.466, Upper Necropolis



**Fig. 7.6** Late Old Kingdom burial with linen wrappings and fastenings preserved on the head of the deceased; B.453, Lower Necropolis



**Fig. 7.7** Linen fastenings on a reed coffin; B.510, Shaft 83, Lower Necropolis

Linen scraps, often coated or soaked in resin, can be found placed in oral and cranial cavities; in the latter case, this would have been done following the removal of the brain tissue, likely for absorption of any residual fluids. At the same time, neatly formed linen plugs (bungs) were placed in the nasal cavities (Fig. 7.8a). Their function could have been dual: to prevent any leakage and to preserve the shape of the nose, which would otherwise have been altered under the pressure of tight wrappings (this can be seen in many mummified remains). Similarly, the chest and abdominal cavities were often filled with linen scraps and rags to restore the original shape and fullness of the body in the abdominal area, following the extraction of the internal organs. These pieces present a particularly interesting collection, as they contain fragments of textiles that visibly vary in quality and their original usage. For example, some fragments show evidence of wear and repair, suggesting they might have originally constituted pieces of garments (Fig. 7.8b). Linen was also used to wrap packages—likely to have contained internal organs removed from the body—that were placed either inside the abdominal cavities or externally, directly next to the body (Fig. 7.8c).

Strips of linen of various quality were subsequently used for body wrapping. Frequently, poorer quality linen would be used for the innermost wrappings, leaving the better-quality fabric for the external and decorative layers. The exception would be cases where the body limbs were first wrapped individually before being wrapped together with the entire body. In many such cases, clean strips of good linen—likely sheets procured especially for that purpose, rather than reused material—would have been used to produce an intricate chevron design (Fig. 7.8d). In addition, linen pads (larger pieces of folded linen) and/or elongated linen features, twisted and





**Fig. 7.8** Lower Necropolis burials; (a) nasal plugs (bungs) made of linen in a child mummy (B.423); (b) evidence of wear and repair on a linen sheet used to wrap a child mummy (B.423); (c) linen-wrapped packet placed by the feet of the mummy (B.474); (d) chevron wrapping pattern on the legs of a partially preserved mummy (B.417); (e, f) shin and toe cords (B.477); (g) linen shroud with fastenings (B.474)





**Fig. 7.8** (continued)

spiral in shape (Fig. 7.8e, f), would have been placed on or around different parts of the body in an attempt to restore its natural shape and accentuate certain features, such as the prominence of the shin bone in the lower leg (shin cords), or for the support and protection of fragile parts (toe cords), before the next stage of body wrapping commenced. The outermost layers of wrappings were usually made of good quality linen; a linen shroud was occasionally placed over the front of the body before the decorative wrappings were finally applied (Fig. 7.8g). In many cases, the overall thickness of the compacted linen layers applied would exceed 10 cm (e.g. Figs. 7.8d and 7.9), which translates to an astonishing amount of linen that would have been used on a single body.



**Fig. 7.8** (continued)

#### 7.2.2.1.4 Cloth Sheets, Shrouds, and Garments

As the evidence from the Upper Necropolis at Saqqara has shown (Sect. 7.2.2.1.3), the body wrapping may have involved voluminous quantities of linen in the form of strips as well as shrouds. The use of the latter has also been attested in several well-preserved burials from the Lower Necropolis, where large sheets of cloth have been identified (Fig. 7.10a). In one instance, the remains of a pleated fabric—similar in appearance to the upper part and sleeves of the Tarkhan dress—have been recovered from the burial of a young female (B.475; Fig. 7.10b). Due to the burial disturbance





**Fig. 7.8** (continued)



**Fig. 7.9** Linen mummy wrappings with resin staining showing an imprint of the deceased's face (innermost layers; B.482); Upper Necropolis





**Fig. 7.10** Upper Necropolis burials; (a) large sheets of linen in B.555; (b) pleated linen fabric in B.475; (c) linen lining in a reed coffin in B.555



**Fig. 7.10** (continued)

caused by looting, it remains unclear whether the garment in question was placed on the body, or was instead deposited inside the coffin, in a manner similar to other pieces of cloth found in contemporary burials at Saqqara. In some of those burials, linen sheets have been found lining the bottom of several reed coffins (Fig. 7.10c).

#### 7.2.2.2 *In Situ* Recording and Documentation of Textiles

As the above examples have shown, the application and use of linen in funerary practices at Saqqara across the periods of funerary activity on site can be described as extensive, complex, and multifaceted. The first step towards integrating textiles in excavation and on-site documentation procedures was to create a protocol for fragile materials, including textiles. Similar to other objects of material culture, textiles are subject to an *in situ* assessment to determine their condition and state of preservation, prior to lifting and their transfer to an on-site storage facility to await specialist study. This multistep methodical approach aims to protect fragile materials and document their archaeological context to ensure the best possible study outcomes. The protocol implemented at Saqqara is as follows:

- (a) general and detailed *in situ* photography;
- (b) written *in situ* documentation, including a detailed description of the state of preservation and condition of linen; visual assessment of quality and quantity used; recording of the location on the body (particularly if only traces or

fragments found); identification and recording of external layers and decorative patterns;

- (c) *in situ* conservation treatment of linen if considered fragile prior to lifting;
- (d) *in situ* sampling if only traces and fragments preserved;
- (e) lifting and transfer directly to the on-site conservation/archaeology lab or bio-archaeology lab (if with human remains);
- (f) in-lab assessment, documentation, and sampling;
- (g) conservation treatment, where applicable, to stabilize and relax the fabric prior to detailed assessment of its condition and state of preservation (e.g. large sheets of cloth; decorated cartonnage); documentation and photography;
- (h) secure storage awaiting specialist study.

In accordance with the regulations of the Ministry of Tourism and Antiquities (formerly Supreme Council of Antiquities) in Egypt, it is not permitted to remove any of the artefacts from an archaeological site without obtaining special permission; hence, all the work (recording, documentation, and the study) needs to be conducted on site. Furthermore, access to the artefacts, which are stored on site, is only available during the fieldwork season. The above conditions impose limitations on the research accessibility of funerary textiles and other artefacts and archaeological remains; therefore, having a suitable work plan, strategy, and team are essential to ensure appropriate treatment of textiles, which, considering the volume and variety documented at Saqqara, can be extremely time-consuming.

### 7.2.3 *Textiles, Funerary Wealth, and Pattern of Looting*

As attested by funerary contexts, textiles used in association with death and burial were both new and old, purpose-made and recycled, coarse and fine-weave. The combination of the aforementioned characteristics and the overall quantity of the material used was not only reflective of the burial practices and body treatment at any given time, but also of the deceased's wealth and social standing.

Despite it being an expensive material, funerary textiles and wrappings were often left behind by looters, whose main interest was the more precious and valuable materials and items, such as amulets and jewellery. This is attested by a distinctive pattern of disturbance inflicted upon mummified remains, where the upper body, customarily adorned with such items, would be the main target for looters, leaving the lower part of the body intact (Fig. 7.11). The evidence of looting can be considered a strong indicator of funerary wealth deemed worthy of looters' attention. This correlation is clearly seen at the Saqqara cemetery, where most of the elite burials from the Lower Necropolis were found disturbed, in contrast to only a small percentage of the richer inhumations that were present among the commoners buried in the Upper Necropolis.

The concept of funerary wealth is associated with social stratification and serves the purpose of differentiating and grouping burials based on a number of factors, the most commonly used across archaeology being the quality and quantity of grave





**Fig. 7.11** A partially damaged mummy due to targeted looting; B.478, Upper Necropolis

goods associated with individual burials. Identification of disparity in funerary wealth in any given cemetery population is considered an indication of the group's social complexity and stratification. With the focus predominantly on the funerary goods, such assessments are difficult, if not impossible, to carry out in cemeteries affected by looting. The issue could be remedied by the introduction of a multivariate assessment of funerary wealth that would be better suited to capturing the complexity and diversity of burial practices, such as those in ancient Egypt.

### **7.2.4 Funerary Wealth Index**

Funerary wealth assessment to determine social stratification in a cemetery population is a well-established tool in archaeology, which has also been applied to ancient Egyptian contexts (e.g. Richards, 2005). In the study of the Middle Kingdom cemetery assemblages at Haraga and Riqqa, Richards (2005) has devised wealth indices based on the perceived value of the materials used to make portable goods.

#### **7.2.4.1 Portable Goods Wealth Index**

Richards' first index was based on the effort required to obtain each of the raw materials and, consequently, their availability to the local population, based on the distance of the source, mode of transport available, and the difficulty of extraction and working the materials (Richards, 2005: 110). The second index attempts to ascertain

the ancient Egyptian view of these materials during the Middle Kingdom, based on cultural, political, and religious factors, as well as economic concerns (Appadurai, 1986; Smith, 1987). These factors were of particular significance in ancient Egypt with regard to metals, such as gold and silver, which were highly symbolic as a result of their strong association with the sun's regenerative power; therefore, they were perceived as the most precious of materials (Wilkinson, 1994: 83–84), although they were more readily available from nearby lands in comparison to other materials. For the value estimates, Richards utilized the ranking of the materials, including precious and semi-precious stones, in Middle Kingdom texts, after Harris (1961) and Aufrère (1991), and the relative values of the commodities in the Ramesside Period, after Janssen (1975). In both indices ('effort expenditure' and 'Egyptian value'), Richards has given a value of '3' to fabric, which was only higher in comparison to wood, bone, pottery, clay, and mud/straw in 'Egyptian value'.

The wealth index designed by Richards considers the perceived or estimated value of materials the goods were made of, in contrast to the more commonly used system of quantification and quality of the artefacts recovered from burial contexts. Still, this approach does not go beyond portable goods.

#### 7.2.4.2 The Saqqara Multivariable Funerary Wealth Index

The funerary wealth index designed for the Saqqara cemeteries has incorporated a broad range of archaeological variables, categorized by: (1) *condition of interment*; (2) *post-mortem body treatment*; and (3) *personal adornment and accompanying funerary goods*. It is intended to measure material wealth and effort expenditure in the Old Kingdom/First Intermediate Period and Graeco-Roman series of burials for the evaluation of social differentiation in these temporally distant cemetery populations (Kozieradzka-Ogunmakin, 2014). This is based on the precondition that social differences in a cemetery population were communicated through wealth symbols and increased energy expenditure, with the elaboration of the burials, and nature and quantity of the accompanying objects, identified as primary indicators of the so-called 'vertical social subdivision' (O'Shea, 1981: 49–50). Social and economic status could be differentially expressed; therefore, a study of social stratification based on funerary data should not be limited to one indicator or variable, but rather incorporate all aspects of the burial, including post-mortem treatment of the body.

The relative values of raw materials and commodities most certainly changed over time, but may not have fluctuated radically. Therefore, in the absence of temporally relevant sources, the value estimations of items included in the Saqqara funerary wealth index have been extrapolated from the value of raw materials represented in the Middle Kingdom cemeteries (Richards, 2005), as well as the prices of commodities (Janssen, 1975; Meskell, 1999), and the social and economic value of funerary art (Cooney, 2007) in New Kingdom Thebes. Unlike other indices, the Saqqara funerary wealth index incorporates a comprehensive spectrum of funerary data, including funerary textiles—their quality and quantity expressed through the pattern of body wrapping (Table 7.1). For the first time, funerary textiles are

**Table 7.1** Funerary Wealth Indices for the Old Kingdom/First Intermediate Period and Graeco-Roman series of Saqqara burials

Funerary wealth Index—Old Kingdom/FipFIP			Funerary wealth Index—Graeco-Roman		
Variable		Rank value	Variable		Rank value
<i>Condition of interment</i>			<i>Condition of interment</i>		
Shaft	>30m <sup>3</sup>	30	Pit grave	Bedrock	3
	20–30 m <sup>3</sup>	20		Dakka/Ok OK structural remains	2
	10–20 m <sup>3</sup>	16		Stone lining/cover	1
	<10m <sup>3</sup>	12		Desert sand	1
Burial chamber	>10m <sup>3</sup>	16	Coffin	Wood	10
	5–10 m <sup>3</sup>	12		Reed/palm-leaf rib	5
	<5m <sup>3</sup>	8	Shroud		6
Coffin	Wood	10	<i>Post-mortem body treatment</i>		
	Reed/palm-leaf rib	5	<b>Wrapping</b>	Elaborate	12
Limestone lid		8		Moderate	6
Burial pit (pseudo-sarcophagus)		4		Simple	4
Pit grave		1		Undetermined	1
<i>Post-mortem body treatment</i>			<b>Fabric quality<sup>a</sup></b>	Fine	3
Wrapping	Elaborate	10		Mixed	2
	Moderate	6		Coarse	1
	Simple	4	Excerebration		2
	Undetermined	1	Evisceration		2
Fabric quality <sup>a</sup>	Fine	3	Resin application	Abdomen	2
	Mixed	2		Skull	2
	Coarse	1		External	2
Funerary plaster mask		6	Body-shape reconstruction		2
<i>Personal adornment and funerary goods</i>			Abdominal cavity filling		1
Golden foil		7	Cartonnage	Gilded mask	8
Bead necklace		5		Body-cover	7
Loose beads		2		Collar	5
Quantity of pers. adornment	>5	4		Panels/plaquettes	3
	<5	2	Garland/wreath		1
Miniature copper vessels		7	<i>Personal adornment and funerary goods</i>		
Miniature copper tools		7	Bronze earrings		3
Canopic jars		6	Faience beads		1
Stone vessel		5	Cowrie shell		1
Linen garment		5	Onion/plant bulb		1
Wooden figure/model		4	Quantity of pers. adornment	>5	4
Wooden headrest		3		<5	2
Wooden staff		2	Wooden canopic box		10
Wooden sandal-soles		2	Wooden figure		6

(continued)

**Table 7.1** (continued)

Funerary wealth Index—Old Kingdom/FipFIP			Funerary wealth Index—Graeco-Roman		
Variable		Rank value	Variable		Rank value
Ceramic vessel		2	Basket		2
Ochre/stone with green pigment		1	Ceramic vessel		1
Animal remains (food)		1	Quantity of funerary goods	>5	4
Animal bone needle		1		<5	2
Quantity of funerary goods	>5	4			
	<5	2			

Archaeological variables were assigned rank values that considered the effort expended on their construction, availability, and value of the materials used, the quantity and quality of individual items, and the cost of services (e.g. excerebration). Separate indices were designed for each period to account for the changes in burial practices

<sup>a</sup>The *quality of fabric* descriptor (fine/mixed/coarse) is purely indicative; it can be refined to include detailed indicators of quality (e.g. type of weave, use of dyes, evidence of wear, etc.)

considered important and valuable data that can contribute to a study of social differentiation in cemetery populations (Kozieradzka-Ogunmakin, 2014). The Saqqara funerary wealth index can serve as a template that can be easily replicated or modified to fit the specific needs for any cemetery under study. More importantly, however, it can be successfully used to investigate social differentiation within heavily looted cemeteries where inhumations have often been stripped of their portable goods and personal adornment, which have traditionally been considered the primary funerary wealth indicators.

7.3 Discussion

As evident at Saqqara and many other ancient cemeteries across Egypt, the use of textiles in funerary contexts spanned millennia. With a holistic approach to the study of the past, this somewhat marginalized artefact type has the potential to offer a unique and valuable insight into many aspects of ancient Egyptian culture; from flax cultivation, textile production, weaving techniques, through to clothing and fashion, trade, and religious and funerary customs, among others (e.g. Carroll & Wild, 2012; Mossakowska-Gaubert, 2020; Riggs, 2014; Ulanowska et al., 2022). The study of funerary textiles can contribute to our understanding of social stratification and funerary wealth (Kozieradzka-Ogunmakin, 2014) and to identifying temporal and spatial distribution of patterns of body treatment (e.g. the use of shin and toe cords; Anđelković & Elias, 2021, Fig. 6; Elias, 2008, Fig. 22).

With the passage of time and development of archaeology as a discipline that bridges the humanities and sciences there is now a greater understanding of ancient Egyptian culture, built on diligent and methodical recording, and a holistic approach to the study of archaeological finds and contexts, largely achieved through

interdisciplinary research and the increasing contribution of modern science and technology (e.g. Loprieno-Gnirs, 2021; Raven & Taconis, 2005). However, in the context of funerary archaeology, one area of expertise remains marginal and largely underutilized. Bearing in mind that ancient Egyptian burials are known for the use of textiles, predominantly but not exclusively as mummy wrappings, it is regrettable that this category of artefacts remains overlooked and understudied. As a result, there are no standardized protocols and guidance on their *in situ* recording and documentation, nor on the storage of textiles recovered from funerary contexts, that can be used in the field. This is an increasingly growing concern for those working directly with interments—archaeologists and bioarchaeologists—who often lack training and/or experience to deal with *in situ* textile artefacts, and are compelled to take unilateral decisions concerning sampling and storage, being guided only by their archaeological experience and intuition, inevitably leading to varying outcomes. The lack of a standardized field methodology and protocol, therefore, can be seen as a hindrance to otherwise methodical studies in archaeology. It is strongly argued that textiles should be treated as an important artefact in their own right, and not merely a medium for answering selective inquiries (e.g. Panenko, 2008; Rzeuska, 2010: 109–113).

## 7.4 Conclusions and Future Work

Petrie's remarks on the complexity of mummy wrappings and duration of time needed for their recording at Hawara resonate very strongly today with those who work in the field of bioarchaeology. *In situ* recording and documentation of funerary textiles is extremely time-consuming due to the nature of this artefact, its often fragile condition, and complex application, and should be conducted by a specialist, or trained team members.

Using the Saqqara necropolis, this paper has advocated for standardized and methodical approaches to *in situ* recording and documentation of funerary textiles, and their greater consideration and integration into archaeological studies of the past through collaborative and interdisciplinary research. The ancient necropolis of Saqqara and its burials demonstrate the complexity and variety of funerary textiles, thus emphasizing the necessity of establishing guidelines and protocols for *in situ* recording, documentation, sampling, and storage of textiles in the field setting, applicable to the Nile Valley contexts. This very task is being undertaken as part of a new bioarchaeological project at Saqqara (*Life and Death in Trying Times: A Bioarchaeological Study of the Effect of Sociopolitical and Climatic Changes on the Memphite Population of Saqqara, Egypt*). With a textile specialist in the team, the project aims to (a) establish standardized recording methods for funerary textiles to aid comparative studies, and (b) highlight their value as an archaeological resource in the study of textile production and usage, post-mortem body treatment, burial practices, social stratification, and climatic and environmental conditions.

**Acknowledgements** The work of the Polish-Egyptian Archaeological Mission at Saqqara (PEAMS; <http://saqqara.uw.edu.pl/en/>) has been conducted with the support of the Ministry of Tourism and Antiquities in Egypt (formerly Supreme Council of Antiquities) and financial support from the Polish Centre of Mediterranean Archaeology (PCMA), University of Warsaw. The bioarchaeological research at Saqqara has been funded by the National Science Centre, Poland (Project ID: 2021/41/B/HS3/00471; <https://saqqaraburials.pcma.uw.edu.pl/>). The author wishes to acknowledge the local workmen and their contribution to the team's ongoing work at Saqqara. Images by the author (Figs. 7.8a, b, d–g and 7.9) and from the photographic archive of the PEAMS held at the PCMA UW (Figs. 7.2, 7.4, 7.10a, c by Wojciech Wojciechowski; Figs. 7.3, 7.5, and 7.6 by Jarosław Dąbrowski; Figs. 7.7, 7.8c, 7.10b and 7.11 by Piotr Lelek). The author thanks the anonymous reviewers for their valuable comments and suggestions.

## References

- Andelković, B., & Elias, J. P. (2021). CT scan of Nesmin from Akhmim: New data on the Belgrad mummy. *Issues in Ethnology Anthropology (Etnoantropoloski problemi)*, 16(3), 761–794.
- Appadurai, A. (1986). *The social life of things: Commodities in Cultural Perspective*. Cambridge University Press.
- Aufrère, S. (1991). *L'Univers minéral dans la pensée égyptienne: essai de synthèse et perspectives*. BdE 105. Institut Français d'Archéologie Orientale.
- Bard, K. (Ed.). (1999). *Encyclopedia of the Archaeology of Ancient Egypt*. Routledge.
- Bard, K. (2003). The emergence of the Egyptian state. In I. Shaw (Ed.), *The Oxford history of Ancient Egypt* (pp. 57–82). Oxford University Press.
- Bárta, M., & Brůna, V. (2006). *Satellite atlas of the pyramid fields of Abusir, Saqqara and Dahshur*. Dryada.
- Carroll, M., & Wild, J. P. (Eds.). (2012). *Dressing the dead in classical antiquity*. Amberley Publishing.
- Cooney, K. M. (2007). *The cost of death: The social and economic value of ancient funerary art in the Ramesside period*. Nederlands Instituut Voor Het Nabije Oosten.
- Cortes, E. (2012). Recovering contexts: The Roman mummies excavated by the Metropolitan Museum of Art in Dahshur, Egypt. In M. Carroll & J. P. Wild (Eds.), *Dressing the dead in classical antiquity* (pp. 75–88). Amberley Publishing.
- DeYoung, G. (2014). Textiles in Egypt. In H. Selin (Ed.), *Encyclopaedia of the history of science, technology, and medicine in Non-Western cultures*. Springer. [https://doi.org/10.1007/978-94-007-3934-5\\_9297-2](https://doi.org/10.1007/978-94-007-3934-5_9297-2)
- Elias, J. (2008). *Shep-en-min: Report of findings from the CT scan of Vassar College CC79.001*. Unpublished Akhmim mummy studies consortium report. Available at [https://www.academia.edu/38435899/Elias\\_Jonathan\\_2008\\_Shep\\_en\\_min\\_Report\\_of\\_Findings\\_July\\_31\\_08\\_1\\_pdf](https://www.academia.edu/38435899/Elias_Jonathan_2008_Shep_en_min_Report_of_Findings_July_31_08_1_pdf). Accessed 22 Jan 2024.
- Hall, R. (1986). *Egyptian textiles*. Shire.
- Harris, J. D. (1961). *Lexicographical studies in ancient Egyptian minerals*. Akademie Verlag.
- Ikram, S., & Dodson, A. (1998). *The mummy in ancient Egypt: Equipping the dead for eternity*. American University in Cairo Press.
- Ikram, S., Vymazalová, H., Hashesh, Z., Gabr, A., Quiles, A., & Megahed, M. (2023). Pushing boundaries: Old kingdom mummification revised. *Journal of Archaeological Science: Reports*, 52, 104272. <https://doi.org/10.1016/j.jasrep.2023.104272>
- Janssen, J. J. (1975). *Commodity prices from the Ramesside period: An economic study of the village of necropolis workmen at Thebes*. E.J. Brill.
- Jeffreys, D. (1999). Memphis. In K. Bard (Ed.), *Encyclopedia of the archaeology of ancient Egypt* (pp. 587–591). Routledge.



- Johnstone, J. (2015). Lost and found: The rediscovery of the Tarkhan dress. In A. Stevenson (Ed.), *The Petrie Museum of Egyptian archaeology: Characters and collections* (pp. 36–37). UCL Press.
- Kaczmarek, M., & Kozieradzka-Ogunmakin, I. (2013). Demographic, metric and palaeopathological study of human remains recovered from the Lower Necropolis at Saqqara. In F. Welc, J. Trzciniński, M. Kaczmarek, I. Kozieradzka-Ogunmakin, A. Kowalska, T. I. Rzeuska, & Z. Godziejewski (Eds.), *Saqqara V. Old Kingdom Structures between the Step Pyramid Complex and the Dry Moat. Part 2: Geology – Anthropology – Finds – Conservation* (pp. 345–421). Neriton.
- Kaczmarek, M., Schweitzer, A., Godziejewski, Z., & Pannenکو, I. (2008). *Saqqara III. The Upper Necropolis, Part II: Studies and photographic documentation*. Neriton.
- Karg, S., Spinazzi-Lucchesi, C., & Diederichsen, A. (2023). Flax for seed or fibre use? Flax capsules from ancient Egyptian sites (3rd millennium BC to second century AD) compared with modern flax genebank accessions. *Genetic Resources and Crop Evolution*. <https://doi.org/10.1007/s10722-023-01753-y>
- Kowalska, A., Kuraszkiewicz, K., & Godziejewski, Z. (2009). Old Kingdom burials with plaster masks from Saqqara. In J. Popielska-Grzybowska & J. Iwaszczuk (Eds.), *Proceedings of the Fifth Central European Conference of Egyptologists. Egypt 2009: Perspective of research* (pp. 107–114). Pułtusk Academy of Humanities.
- Kozieradzka-Ogunmakin, I. (2014). *A study of social stratification and physical health in an ancient Egyptian population of Saqqara* (Unpublished PhD). University of Manchester.
- Kuraszkiewicz, K. (2013). *Saqqara V. Old Kingdom structures between the Step Pyramid complex and the Dry Moat. Part 1: Architecture and development of the necropolis*. Neriton.
- Landi, S., & Hall, R. M. (1979). The discovery and conservation of an ancient Egyptian linen tunic. *Studies in Conservation*, 24, 141–152.
- Loprieno-Gnirs, A. (Ed.). (2021). *Life histories of Theban tombs: Transdisciplinary investigations of a cluster of rock-cut tombs at sheikh 'Abd el-Qurna*. American University in Cairo Press.
- Macramallah, R. (1940). *Fouille à Saqqara: un cimetière archaïque de la classe moyenne du peuple à Saqqarah*. Imprimerie Nationale.
- McKnight, L. M., & Atherton-Woolham, S. (2015). *Gifts for the gods: Ancient Egyptian animal mummies and the British*. Liverpool University Press.
- Melelli, A., Shah, D. U., Hapsari, G., Cortopassi, R., Durand, S., Arnould, O., Placet, V., Benazeth, D., Beaugrand, J., Jamme, F., & Bourmaud, A. (2021). Lessons on textile history and fibre durability from a 4,000-year-old Egyptian flax yarn. *Nature Plants*, 7, 1200–1206.
- Meskel, L. (1999). *Archaeologies of social life. Age, sex, class et cetera in Ancient Egypt*. Blackwell.
- Moshenska, G. (2014). Unrolling Egyptian mummies in nineteenth-century Britain. *British Society for the History of Science*, 47(3), 451–477.
- Mossakowska-Gaubert, M. (Ed.). (2020). *Egyptian textiles and their production: 'Word' and 'object'* (p. 86). Zea E-Books Collection. Available at <https://digitalcommons.unl.edu/zeabook/86>. Accessed 21 Jan 2024
- Myśliwiec, K., Kuraszkiewicz, K., Czerwik, D., Rzeuska, T., Kaczmarek, M., Kowalska, A., Radomska, M., & Godziejewski, Z. (2004). *Saqqara I. The Tomb of Merefnebef*. Neriton.
- Myśliwiec, K., Kuraszkiewicz, K., & with contr. by Kowalska, A., Radomska, M., Rzeuska, T. I., Kaczmarek, M., Kozieradzka, I., Godziejewski, Z., Ikram, S., Zatorska, A. (2010). *Saqqara IV. The Funerary complex of Nyankhnefertem*. Neriton.
- O'Shea, J. (1981). Social configurations and the archaeological study of mortuary practices: a case study. In R. Chapman, I. Kinner, & K. Ransborg (Eds.), *The archaeology of death* (pp. 39–52). Cambridge University Press.
- Panenکو, I. (2008). Mummy bandages found in the upper necropolis. In M. Kaczmarek, A. Schweitzer, Z. Godziejewski, I. Pannenکو, & I. I. I. Saqqara (Eds.), *The upper necropolis, part II: Studies and photographic documentation* (pp. 559–578). Neriton.
- Petrie, W. M. F. (1911). *Roman portraits and Memphis (IV)*. School of Archaeology in Egypt.

- Radomska, M., Kowalska, A., Kaczmarek, M., Rzeuska, T. I., & with contr. By Kopp, E., Kuraszkiewicz, K. O., Winnicki, J. K. (2008). *Saqqara III. The Upper Necropolis, Part I: The catalogue with drawings*. Neriton.
- Raven, M., & Taconis, W. K. (2005). *Egyptian mummies: Radiological atlas of the collections in the National Museum of antiquities in Leiden*. Brepols Publishers.
- Richards, J. (2005). *Society and death in Ancient Egypt. Mortuary Landscapes of the Middle Kingdom*. Cambridge University Press.
- Riggs, C. (2014). *Unwrapping Ancient Egypt: The shroud, the secret and the sacred*. Bloomsbury Academic.
- Rzeuska, T. I. (2010). A wooden chest from west Saqqara and its enigmatic contents. Remarks on the mummification process in the Old Kingdom. *Études et Travaux*, XXIII, 89–135.
- Smith, M. E. (1987). Household possessions and wealth in agrarian states: Implications for archaeology. *Journal of Anthropological Archaeology*, 6(7), 297–335.
- Thompson, D. J. (1988). *Memphis under the Ptolemies*. Princeton University Press.
- Trzciński, J., Kuraszkiewicz, K. O., & Welc, F. (2010). Preliminary report on geoarchaeological research in West Saqqara. *Polish Archaeology in the Mediterranean*, XIX, 194–208.
- Ulanowska, A., Grömer, K., Vanden Berghe, I., & Öhrman, M. (Eds.). (2022). *Ancient textile production from an interdisciplinary perspective. Humanities and natural sciences interwoven for our understanding of textiles*. Springer.
- Vogelsang-Eastwood, G. (1992). *The production of linen in Pharaonic Egypt*. Stichting Textile Research Centre.
- Vogelsang-Eastwood, G. (1993). *Pharaonic Egyptian clothing*. Brill.
- Vogelsang-Eastwood, G. (2000). Textiles. In P. T. Nicholson & I. Shaw (Eds.), *Ancient Egyptian materials and technology* (pp. 268–298). Cambridge University Press.
- Welc, F., & Marks, L. (2014). Climate change at the end of the Old Kingdom in Egypt around 4200 BP: New geoarchaeological evidence. *Quaternary International*, 324, 124–133.
- Welc, F., Trzciński, J., Kaczmarek, M., Kozieradzka-Ogunmakin, I., Kowalska, A., Rzeuska, T. I., Godziejewski, Z., & with a contr. by Weker, W. (2013). *Saqqara V. Old Kingdom structures between the step pyramid complex and the dry moat. Part 2: Geology – Anthropology – Finds – Conservation*. Neriton.
- Wilkinson, R. H. (1994). *Symbol and magic in Egyptian art*. Thames and Hudson Ltd.

**Iwona Kozieradzka-Ogunmakin** is a bioarchaeologist specializing in the study of human mummified and skeletal remains. She holds a PhD in Bioarchaeology from the University of Manchester, MSc in Human Osteology and Funerary Archaeology, and MA in Archaeology. She has worked extensively in Egypt and Sudan, and has been the lead bioarchaeologist at Saqqara since 2006. She is currently Deputy Director of the Polish-Egyptian Archaeological Mission at Saqqara.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



**Part III**  
**Case Studies in Europe and the Nile**  
**Valley—Textiles Separated from Bodies**

## Chapter 8

# Wrapping Practices in Medieval Sudan: Case Studies from Gebel Adda



Magdalena M. Wozniak

**Abstract** Gebel Adda was located in Lower Nubia, on the eastern bank of the Nile, ca. 300 km south of Aswan. During the medieval period, it was an important administrative centre of the Christian kingdom of Makuria and, in 1365 CE, it became the new royal residence. The site was explored in the 1960ies during the Nubian Campaign, but the excavations have only been partially published. An important part of the archives and most of the textiles (retrieved from burials) are housed today in the Royal Ontario Museum, Toronto. Some pieces are also in the collections of the Nubia Museum, Aswan. However, the location of the anthropological documentation remains unknown. This paper offers a tentative reconstruction of the textile layers in four elite burials dated to the 14th c. CE, based on the available archaeological records and archival documentation. It aims at demonstrating the importance of a detailed study of the burials to detect the differences in treatment and installation of the bodies in the crypts and, linking the results of the analysis with the historical context, formulate an hypothesis about the identity of Gapoiapa.

**Keywords** Funerary wrappings · Medieval Nubia · Elite burials · Silks · Archaeological documentation · Archives · Material concordance

---

M. M. Wozniak (✉)

Polish Centre of Mediterranean Archaeology, University of Warsaw, Warsaw, Poland

e-mail: [m.m.wozniak@uw.edu.pl](mailto:m.m.wozniak@uw.edu.pl)

© The Author(s) 2025

E. Yvanez, M. M. Wozniak (eds.), *Funerary Textiles in Situ*, Interdisciplinary Contributions to Archaeology, [https://doi.org/10.1007/978-3-031-69461-5\\_8](https://doi.org/10.1007/978-3-031-69461-5_8)

167

## 8.1 Introduction

Most of our knowledge of relations between Nubia and Egypt was compiled by Egyptian historians, who often based their knowledge on the archives of the Egyptian chancellery.<sup>1</sup> Ibn Abd al-Zahir (1223–1293) was one such chancery scribe who produced, among other works, three biographies of the early Mamluk sultans: Baibars, Al-Mansur Qalawun, and Al-Ashraf Khalil. Two other contemporary historians were Ibn Shaddad (1217–1285) and al-Nuwayri (1279–1333).<sup>2</sup> All three document increasing intervention by the Mamluk sultans in the succession disputes of the Makurian dynasty, initiated by Baibars (reigned 1260–1277) who conducted several expeditions into Nubia in order to place a Muslim king on the throne of Dongola. However, after five decades, it seems that the Mamluk policy shifted under the third reign of Sultan al-Nasir Muhammad (1301–1341); instead of trying to conquer Nubia, the sultan finally acknowledged the reign of Kanz al-Dawla, letting the Makurian king deal with the migration of Bedouin tribes from Upper Egypt to Nubia (Seignobos, 2016, 363–364). Then Egyptian sources remain silent about Nubia for the next four decades.

### **Dongola—Gebel Adda, Medieval Kingdom of Makuria, 1365 CE.**

#### **Cairo—Gebel Adda, 1365 CE.**

**Nubian Kings, Bedouins, and Mamluks.** Thanks to Maqrizi (in Vantini, 1975, 698), we know that the Banu al-Kanz allied with the tribe of the Banu Ikrima and organized raids between Aswan and Sawakin, plundering traders and travellers. Such a situation was certainly not acceptable for the Mamluk empire, which depended heavily on trade with the Red Sea. Therefore, when a Nubian delegation arrived in Cairo in December 1365, asking for intervention by the Mamluks, the sultan agreed.

The letter brought by the Nubian delegation offered a detailed description of the events which explained why the Nubian king asked for assistance. These details are of crucial importance for the context of the burials of church IV in Gebel Adda.

We can reconstruct the following events:

- (a) [In 1365] a nephew of the Nubian king rebelled against his uncle and marched on the Nubian capital city—Dongola (Fig. 8.1)—with his allies, the Arab tribe of Banu Ja'd. The king was killed in the battle;
- (b) The king's brother, Apakyrē,<sup>3</sup> took the throne and withdrew north to Daw [Gebel Adda] to organize resistance, while his nephew sat on the throne of Dongola;

<sup>1</sup>It must be borne in mind that this kind of source is necessarily biased, especially as it retains traces of conflictual situations, and also often aimed to highlight the grandeur of the Egyptian authority (Seignobos, 2018, 143).

<sup>2</sup>Chosen fragments of their works that concern the Mamluk policy in Nubia were compiled in Vantini, 1975. For an analysis of the relations between Egypt and Nubia, see Garcin, 1976, Cuoco, 1986, and, more recently, Seignobos, 2016.

<sup>3</sup>Possible identification suggested by Seignobos, 2016, 368.

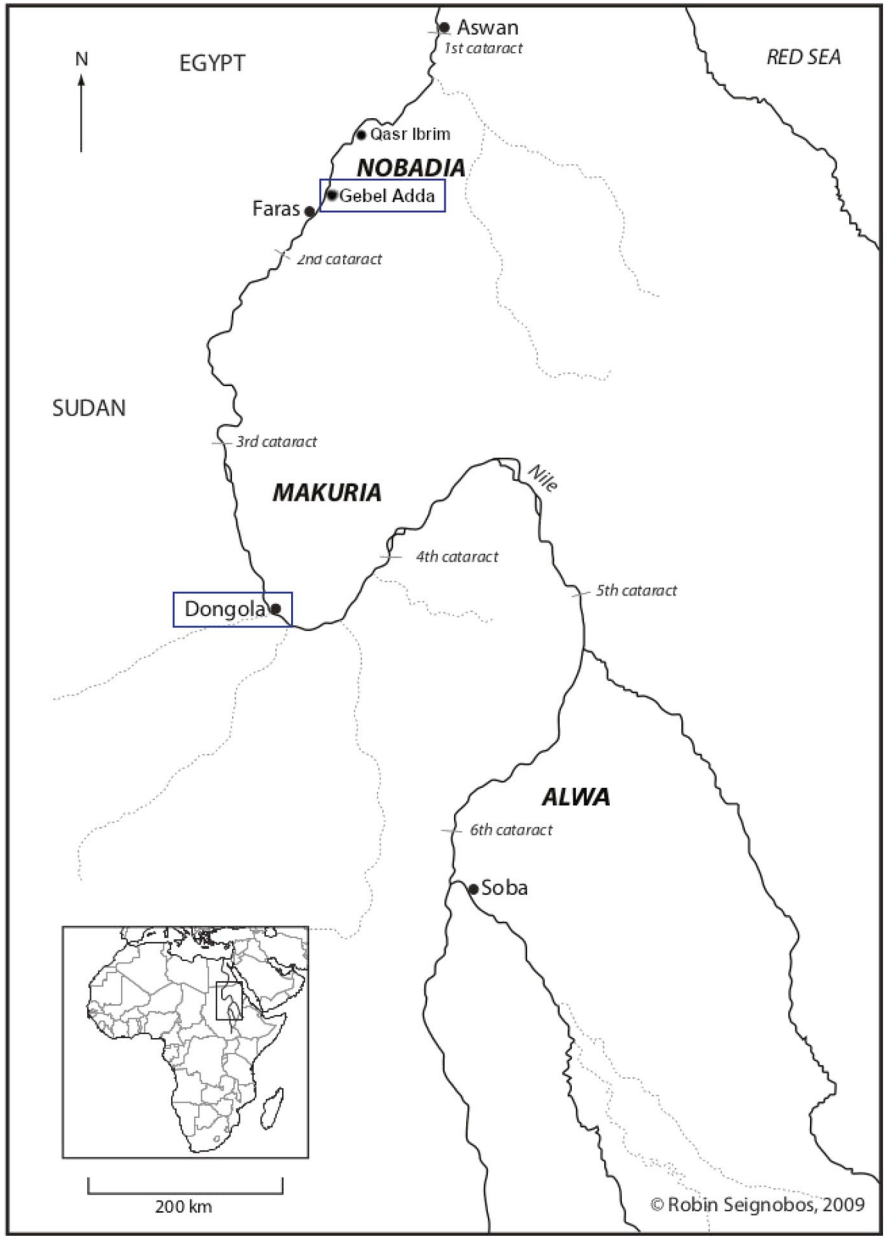


Fig. 8.1 Medieval kingdom of Makuria with Dongola and Gebel Adda. (© Robin Seignobos)



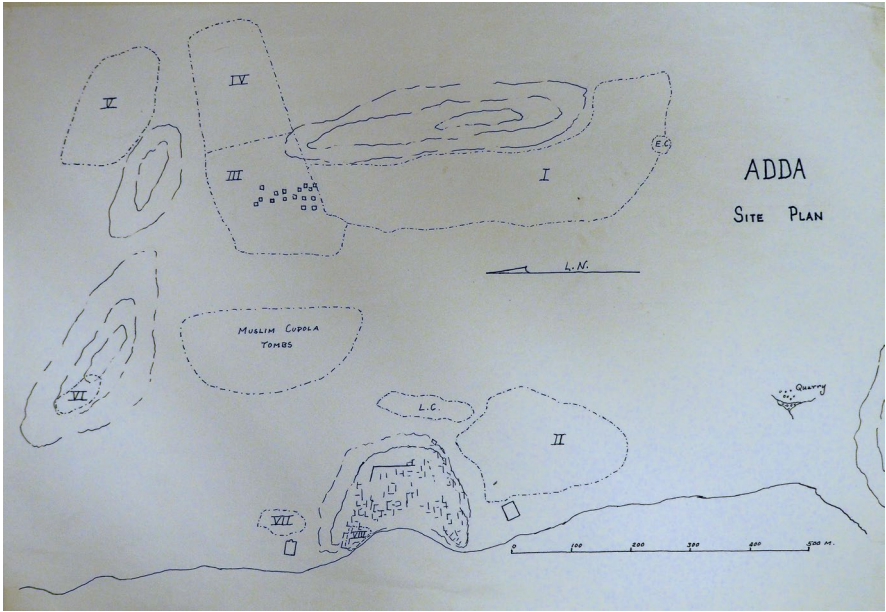
- (c) Soon, the rebel nephew realized that his powerful allies did not want to go back to their own lands, so he trapped their emirs and killed many of them. Without waiting for the Bedouin's army riposte, he evacuated Dongola, took all the goods he could carry, and flew to Gebel Adda where he asked his uncle to forgive him;
- (d) King Apakyrē forgave his nephew and both agreed that Apakyrē would remain on the throne while the nephew would be his eparch.

After their reconciliation, King Apakyrē sent an envoy to Cairo, asking the sultan to help him to regain control over his kingdom. As outlined above, a military intervention was also in the interests of the Mamluk sultans, but this time the Egyptian army limited its action to Gebel Adda and to the island of Meinarti, at the Second Cataract, where the Bedouins were apparently established. After the battle, we are told that 'an agreement was signed, under which the seat of the king of Nubia would be in the fortress of Daw, because Dongola was in ruins (...) and also because it was feared that the Banu Ja'd would attack again and capture the king if he settled at Dongola' (Maqrizi, in Vantini, 1975, 701). This is how the Nubian monarchy left Dongola, its capital city since the 6th c. CE, and established Gebel Adda as the new (and last) capital of the Christian kingdom of Makuria.

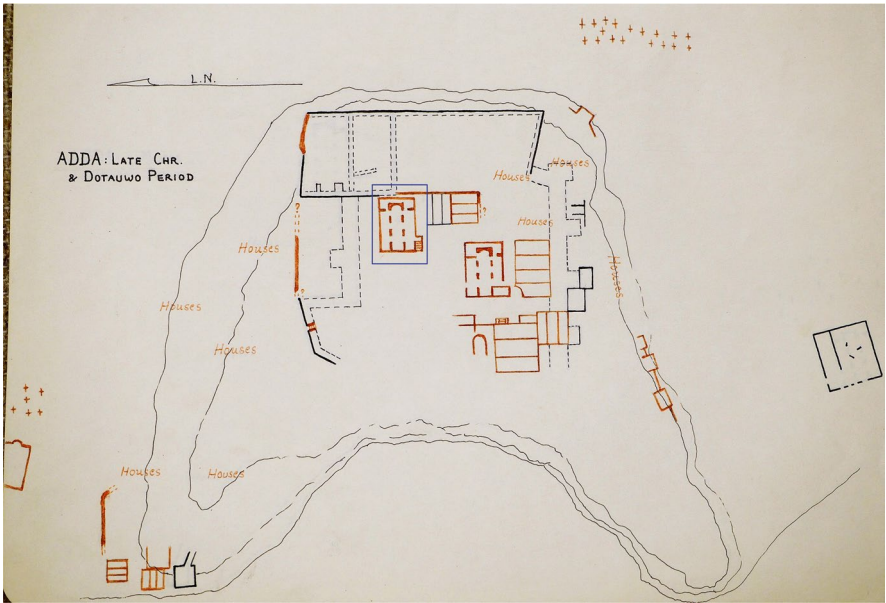
### **Gebel Adda, Egyptian Nubia, 1967 CE**

**Archaeologists enter the scene** Between 1963 and 1967, large scale excavations at Gebel Adda (Egyptian Nubia) were conducted by Nicholas B. Millet for the American Research Centre in Egypt. The expedition was part of the International Nubian Campaign and investigated, to varying degrees, the important areas of the Citadel, as well as the five cemeteries from different epochs surrounding the settlement (Fig. 8.2). Archaeological evidence attests to the city's continuous occupation from 200 CE to the Ottoman period (sixteenth–eighteenth centuries CE). During the clearance of the Medieval layers, it became apparent that the Citadel's buildings dated to the earlier Medieval phases had been razed to set up a new city during the Late Christian period (thirteenth–fifteenth centuries CE). A major addition of this period was the construction of a palatial complex built in a U-shaped plan. The first buildings were erected in the thirteenth century CE, and enlarged in the fourteenth century CE. A new church (church 7), entirely decorated with frescoes, was also added to the palatial buildings during that time. This church functioned simultaneously alongside church 4, which occupied the edge of the central plaza, and church 6—a small chapel in Cemetery VII.

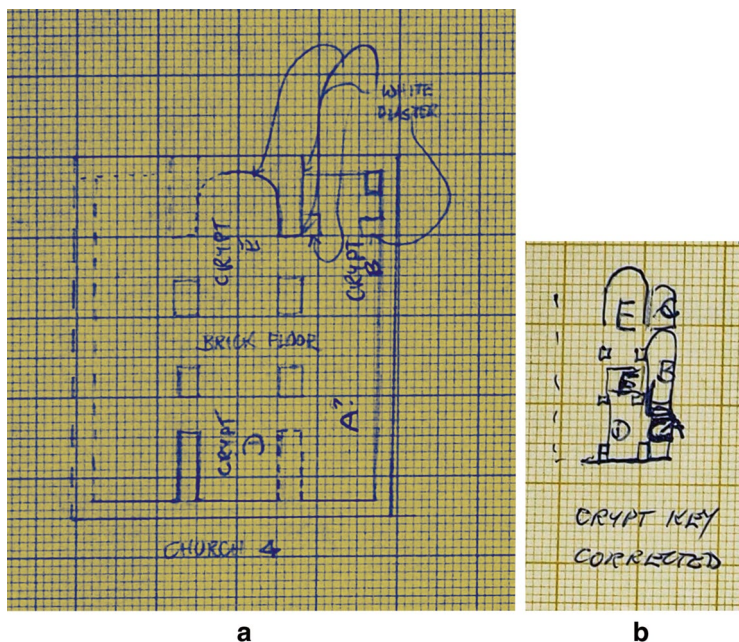
The cross-checking of written sources with the results of Millet's excavations is highly informative, as it demonstrates that, already in the thirteenth century CE, the fortress of Gebel Adda was not only an important administrative centre, but also served as a possible temporary residence of the Nubian authorities, since the first buildings of the so-called 'palatial complex' were built in that period. The erection of church 4, in the centre of the Citadel, also dated to the thirteenth century CE (Fig. 8.3). It was built from mudbrick, on top of the foundations of an older house composed of storage rooms on the ground floor and living rooms above



**Fig. 8.2** Site map showing the citadel and the cemeteries (marked in Roman numerals). (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum)



**Fig. 8.3** Site plan documenting the buildings from the medieval period (church 4 in the blue rectangle). (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum)



**Fig. 8.4** Crypts coding plans by Nicholas Millet (scanned from the field diary). Left: church 4 plan with crypt coding from 29.12.1965; right: corrected plan for church 4 with new crypts coding from 30.01.1966. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum)

(Millet, 1967: 59). The storage rooms were integrated into the church plan and used as crypts. Millet's team discovered a total of six 'vaulted' burials, dated to the late thirteenth century CE (Fig. 8.4).

Church 4 was investigated between 29 December 1965 and 26 January 1966, with most of the crypts excavated by 10 January (Table 8.1). Vaults C and E, the easternmost ones, were empty: traces of breaking and resealing were documented for vault C, while vault E, located under the altar, appeared empty, with no visible traces of use. The other four vaults still contained burials (three intact, one disturbed), richly equipped, judging by the number and the quality of the textiles found.

These burials are quite exceptional because very few elite inhumations from the Medieval period have been excavated to date in the Sudan. Despite their remarkable nature, these burials were never published. A significant part of the archives and most of the textiles are housed today in the Royal Ontario Museum (ROM), Toronto. In the framework of the Nubian Campaign's agreement on the sharing of archaeological objects, some textiles were also sent to Cairo where they were divided between the Coptic Museum, the Egyptian Museum, and the Museum of Islamic Art (archival documentation). In recent years, the textiles housed at the Museum of Islamic Art have been relocated to the Nubian Museum in Aswan and the Egyptian

Table 8.1 Chronology of the vaults' investigation

27.12.1965	28.12.1965	29.12.1965	30.12.1965	31.12.1965	01.01.1966	02.01.1966
03.01.1966	04.01.1966	05.01.1966	06.01.1966	07.01.1966	08.01.1966	09.01.1966
10.01.1966	11.01.1966	12.01.1966	13.01.1966	14.01.1966	15.01.1966	16.01.1966
17.01.1966	18.01.1966	19.01.1966	20.01.1966	21.01.1966	22.01.1966	23.01.1966
24.01.1966	25.01.1966	26.01.1966	27.01.1966	28.01.1966	29.01.1966	30.01.1966

Vault A  
Vault B  
Vault C

Vault D  
Vault E  
Vault F

Museum of Textiles in Cairo (field investigation by the author, December 2017<sup>4</sup>). The present location of the anthropological remains and documentation is currently unknown.

Our goal is to reassemble the inventory of textiles related to each of these burials, and to reconstruct as precisely as possible the sequence in which the textiles were placed on/around the body of the deceased and in the burial. The aim of such research is to gain insight into the gestures accompanying the arrangement of the body and its placement in the crypt, and further to distinguish the preparatory stages which were accomplished by a limited number of persons around the physical body from the more public part of the ceremony with the presence of a larger community.

## **8.2 Excavating in the Archives (Toronto, Royal Ontario Museum, November 2017)**

As mentioned, a significant number of textile fragments retrieved from burials in church 4 are kept in the ROM. The museum also preserves the archives of Nicholas Millet's expedition, which consists of an object register (paper version—digitalized), the excavation journal (four paper portfolios, handwritten by Millet with sketches, then machine typed), and field notes by excavators (sorted in separated files labelled by provenance—buildings, cemeteries, etc.) including plans, sections, and drawings. There is also an inventory of the photographic documentation (paper notebook, photographs numbered and listed by seasons) and two boxes with black and white negatives, but some sections are missing. Beside this 'excavation' archive, which was produced in the field, the collection additionally preserves other documents, such as a catalogue of the textiles which was elaborated much later in the museum by a textile conservator. The museum also keeps correspondence between Nicholas Millet and his collaborators, dealing with the objects from Gebel Adda.

The information about the textiles and the burials supplied by this various documentation is uneven in quantity and quality, but all the folders were studied to retrieve the available data. The collective study of this documentation also reveals some inaccuracies or even contradictory information about the provenance of some of the textiles, which appeared at various stages during the creation of the archive. One important issue is the labelling of the burial vaults, which was first established on 29 December 1965, where only four vaults are marked A-B-D-E respectively; this sketch was later updated, as it appears again in the excavation journal on 30 January 1966, as a quick drawing with vaults marked A-B-C-D-F-E (Fig. 8.4). This second sketch itself bears corrections: crypt C was initially marked 'A'; crypt A was

---

<sup>4</sup>The author noted that the core of the objects from the Egyptian Textile Museum are now displayed in the temporary exhibition hall at the National Museum of Egyptian Civilization, Cairo (visit in March 2023). NMEC colleagues informed the author that the textiles would remain in the NMEC storerooms after the exhibition ends. The whereabouts of the pieces from Gebel Adda kept formerly in the Egyptian Textile Museum need to be investigated.

initially drawn immediately underneath crypt B, then repositioned lower—the correction is marked with bold line; crypts E and F were also apparently interchanged in the initial sketch, as a lower bar was added to the ‘F’ marking the upper crypt, making it into an ‘E’, while the original ‘E’ was retraced with a bold line to become ‘F’ (but the original lower bar is still visible). Inconsistent labelling also becomes apparent when comparing the various authors’ notes. In his field notes, Kent Weeks describes vault D as located ‘in the NW part of the Church’, specifying that in fact ‘the E. end of the crypt’ is ‘called Crypt D’; however, in the excavation journal Millet places vault D ‘under sanctuary’—Weeks, on the contrary, labels ‘vault E’ the one ‘lying beneath the altar area’. The labelling was finally corrected by Millet in the excavation journal sketch dated 30 January 1966, but these inconsistencies, present several times in the excavation journal descriptions from December and January, have not been retro-corrected (neither in the handwritten pages, nor later when they were typed up).

Since not all the objects retrieved from excavations were registered in the object register,<sup>5</sup> a systematic review of the field documentation and excavation journal was required in order to establish the final list of objects found in the burial and check their concordance with the textile inventory. In the case of contradictory data, the information contained in the field notes and the object register was privileged, as I considered the authors of these documents as the best informed. The results of this investigation are compiled in separate tables for each vault, namely A, B, D, and F, vaults C and E being empty. The descriptions are cited textually, with the abbreviations used by their authors.

To facilitate the reading of the tables, all the words describing objects from the burial are marked in bold, while the verbs indicating the position of the textile on the body are in italics; the passages dealing with the labelling of the crypts are underlined, and drawings and plans are marked in capitals. Indications between square brackets are the author’s own additions.

### 8.2.1 *Burial in Vault A*

The available data retrieved from field notes, drawings, and from the excavation journal are compiled in Table 8.2. The images of the textiles are shown in Plate 8.1.

The sources are largely concordant, describing the body of the deceased as:

- (a) ‘Tightly wrapped’ in a shroud made of fine cloth, bound and tied;
- (b) then ‘loosely’ covered with ‘quilt’ with ‘gold brocade’;
- (c) and laid on a reed mat.

Interestingly, the inscription on the shroud is mentioned only by Millet in the excavation journal, while it seems unnoticed by Weeks, despite his examination of the

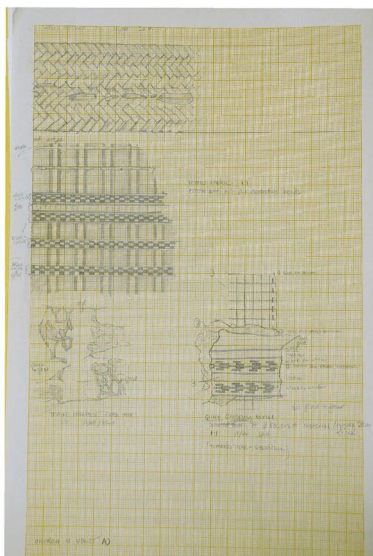
<sup>5</sup>The object register contains a total of 14 entries related to the vault burials excavated from church 4, while the total number of items mentioned in the field notes is 23.



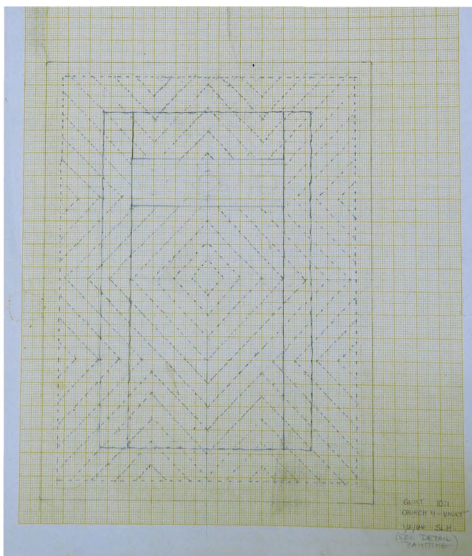
**Table 8.2** Data for burial in vault A

Vault A		
Date	Field notes and drawings (KRW=Kent R. Weeks <sup>a</sup> )	Excavation journal (NBM = Nicholas B. Millet)
29.12.1965		Kołataj <sup>b</sup> drawing brick floor in church 4 [...] weeks ready to work on church 4. [...] at 10:15 started removing floor of CH. 4 and vaults beneath. In the space between the brick floor and the sides of the vault itself were found some sherds, one of late Christian fine-line ware. The body beneath the vault (on the rubbish) seems to be a very poor Christian burial. <u>SKETCH PLAN OF CH.4 WITH VAULTS' LABELS. [crypts A, B, D, E]</u>
30.12.1965		Weeks is expanding his clearance into other vaults below church 4.
01.01.1966	Incorporating notes from 30 December 1965 Clearing of a vaulted chamber beneath floor continues. <i>Wrapped</i> body in S.E. Corner, <i>covered</i> with a <b>heavy brocade quilt</b> having gold thread visible in places, <i>lying</i> on a <b>reed mat</b> , was cleaned for photography. Plan + section of the burial chamber. [on the drawing, body labelled as] 'BODY "A" + <b>woven reed mat</b> ; body <i>covered</i> with <b>quilt</b> '. Skeleton from chamber: Adult female. <i>Tightly wrapped in fine cloth, bound &amp; tied. Quilt wrapped loosely around</i> body. <b>Mat</b> lies beneath quilt. Head to W., on back, <i>fully extended</i> . Skull & other bones disturbed.	The body in the 'cellar' of Ch. 4 is <i>wrapped</i> in a <b>quilt</b> and <i>laid</i> on a <b>mat</b> head west. [...] the body in the 'cellar' has been removed. <b>A long ON<sup>c</sup> inscription runs down part of the shroud</b> , and the <b>quilt</b> in which the corpse was <i>wrapped</i> was once a <b>gay affair with a strip of gold brocade</b> . [...] some of the young Egyptians from the temple come in the afternoon, among them Abdel Muiz from Zakis lab, and he cleaned some of the fabric for us.
04.01.1966	Excavation of subfloor vault continues. <u>Vault from which wrapped body came has been designated 'A'; new vault with coffin is 'B'.</u> PLAN + SECTION	

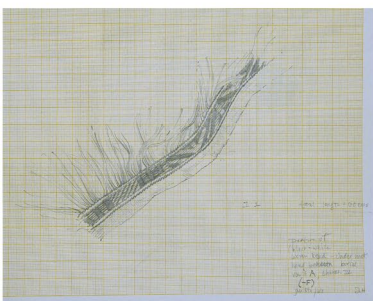
<sup>a</sup>Weeks was the mission's anthropologist<sup>b</sup>Kołataj was the architect<sup>c</sup>= Old Nubian



Top: Reed mat (object d), middle: red silk (object f), low: possibly quilt detail (object c).  
Drawing by S.L. Howe 01.01.1966



Detail of quilt (object c) construction.  
Drawing S.L. Howe 08.01.1966



Black and white band (object e).  
Drawing by S.L. Howe 05.01.1966



Gold brocade inset of quilt (object c).  
Drawn and colour painted. Author not mentioned.



Red silk ROM 973.24.3479 (object f).  
Photograph MMW, Courtesy ROM



Left: Quilt (object c?) ROM 973.24.3480. Photograph ROM.  
Right: Fragment of silk layer from quilt (object c?) ROM 973.24.3480.2. Photograph MMW, Courtesy ROM

All drawings by S.L. Howe, Gebel Adda Archives, Courtesy ROM

**Plate 8.1** Textiles from burial vault A (Komar). Left: (top) Drawing of reed mat (object d), red silk (object f) and possibly quilt (object c) by S.L. Howe. 01.01.1966. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum); (middle) Drawing of black & white band (object e) by S.L. Howe. 05.01.1966. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum); (low) Red silk ROM 973.24.3479 (object f). (Photograph MMW, Courtesy Royal Ontario Museum). Left: (top) Drawing of quilt (object c) by S.L. Howe 08.01.1966. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum); (middle) Painted drawing of quilt's inset (object c). Author unknown. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum); (low) Quilt (object c) ROM 973.24.3480. (Photograph © Royal Ontario Museum and photograph of fragment 973.24.3480.2 by MMW, Courtesy of Royal Ontario Museum)

body ('skeleton from chamber: Adult female', 'skull and other bones disturbed'). The field notes also mention the presence of a 'small red-ware dish lying at head of body, re-used as a lamp'. Last but not least, as mentioned in the excavation journal entry for 15 January, Millet was able to decipher the deceased's name written on the shroud as Komar<sup>6</sup> (cf. *infra*).

The object register has two entries related to the burial in vault A on pages 177 and 178 (indications in italics by the author):

Number	66:1:36	66:1:38
Antiquities Reg. No.	CIM [= <i>Cairo Islamic museum</i> ]	CCM [= <i>Cairo Coptic museum</i> ]
DESCRIPTION	QUILT. UNBLEACHED COTTON WITH GOLD BROCADE INSET (.20 X .70 m.) ON FRONT SIDE.	PORTION OF LINEN SHROUD WITH OLD NUBIAN TEXT
DATE FOUND	JAN 4	4 JAN
PHOTO No	<i>n.d.</i>	3232
SITE	GEBEL ADDA	GEBEL ADDA
LOCUS	CIT. CHURCH 4 VAULT A	CIT. CHURCH 4 VAULT A
REMARKS	LENGTH 1.90 m WIDTH 1.50 m.	WIDTH .675 m. LENGTH .62 m.
DATE	LATE CHRISTIAN	L. CHRISTIAN
DISPOSITION	CAIRO I.M.	CAIRO C.M.
DRAWING	<i>Front side of the quilt; scale</i>	<i>n.d.</i>

The general description of the textiles is relatively consistent with the field documentation; however, the dates given for the find do not match, as vault A was explored between 29 December 1965 and 1 January 1966. Vault A is mentioned in a field note from 4 January, which states that the vault where the wrapped body was found has been labelled 'A', but it is too tenuous to argue that this was the cause of the erroneous information in the object register. An interesting fact to note is that the shroud has not been preserved in its entirety; only the inscribed portion has been cut and saved. The two objects from vault A were given to the Egyptian authorities when the finds were shared.

The Gebel Adda collection kept in Toronto has in its textile inventory three other textiles attributed to vault A, namely items ROM 973.24.3479 (red silk rectangle), ROM 973.24.3480 (silk and cotton quilt), and ROM 973.24.2906 (silk coat fragment).

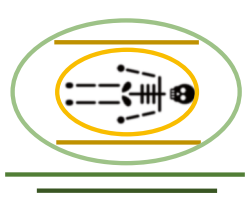
The first silk textile is described in the textile inventory as 'shroud fragment?' and measures 18 x 36 cm. However, this piece, decorated in plaid effect in ecru and black on a red ground with additional bands, does not seem to correspond to any of the items described by the excavators. As for the quilt, it is composed of an upper layer of half-silk decorated with bands sewn on a linen lining, chequered in white and blue; it is probably stuffed with raw cotton. This piece does not seem consistent with the description nor the drawing of the quilt in the object register, which was given to the Islamic Museum in Cairo. However, these two textile objects are indeed documented in field drawings by S.L. Howe from 1 January 1966 and are assigned

<sup>6</sup>Komar is referred to as 'the daughter of the (beautiful Holy) Virgin Mary' and the grammatical features (adjectives, verbs) also confirm she was a woman (van Gerven et al., [forthcoming](#)).

to Church 4 vault A. Does this mean that in fact only the gold brocade inset was left in Cairo, while the quilt itself was kept by Millet’s expedition? Or were there two different quilts: one with a gold brocade inset and a second with the striped silk layer lined with blue chequered cotton?<sup>7</sup> Until the piece given to the Egyptian authorities is identified, this question cannot be answered.

The last object also attributed to vault A is a fragment of a half-silk coat decorated with stripes with a floral pattern; interestingly, the whole coat is listed in the object register under the number 66:1:70, where its provenance is clearly given as ‘Cit. Church 4 Vault D’. This item was given to the Egyptian authorities in 1966, and today is displayed in the Nubian Museum in Aswan (with a fragment of the lower right panel—the one kept in Toronto—missing). Based on this information, the coat should not be added to the textile inventory of burial vault A (Table 8.3).

**Table 8.3** Inventory list of the objects from burial vault A and visualization

Burial layers <sup>a</sup>	Object description <sup>b</sup>	Textile concordance	Present location
a)	Inscribed shroud	Register 66:1:38	Unknown
b)	Bindings	Not registered	Unknown
c)	Cotton quilt with brocade inset	Register 66:1:36 and detail drawing in the field documentation (on the same plate, fragments from silk and cotton quilt)	Unknown (brocade inset); ROM 973.24.3480 (silk and cotton quilt)
d)	Woven reed mat	Not registered; drawn	Unknown
e)	Black and white band (under mat lying beneath burial vault A)	Not registered; drawn	Unknown
f) ?	Red silk fragment with plaid-effect decoration	Not registered; drawn	ROM 973.24.3479
			

<sup>a</sup>Ordered from the innermost (body) to the outermost

<sup>b</sup>As mentioned, a red silk rectangle with plaid-effect decoration in white and black (ROM 973.24.3479) and a silk quilt (ROM 973.24.3480) are documented in detail in the drawings. It is not clear, however, if the silk quilt and the quilt with the brocade inset are two layers of one quilt, or if the silk quilt was, in fact, a second quilt. In this tentative inventory, I consider them together as only one quilt. The position of the red silk in the burial is not given; for this reason, it is listed in the table but does not appear in the reconstruction scheme

<sup>7</sup>The author could not examine this piece during the study visit in 2017.

## 8.2.2 *Burial in Vault B*

The available data for burial vault B are compiled in Table 8.4. Visual documentation of the textiles is shown in Plates 8.2, 8.3, and 8.4.

For this burial, we have information about the name, sex, and age of the deceased: Gapoiapa, male, aged c. 25 years.

The description of the layout of the coffin burial, by far the most richly equipped from all the burials discovered in church 4, is well documented in the archives. The excavation files focus on the description of the wooden coffin in the vault, while the private correspondence of S.L. Howe offers a detailed inventory of the textiles inside the coffin itself. The résumé produced in the excavation journal records the main features registered both by Weeks and Howe, but some notable differences appear. The body of the deceased is described:

- (a) by both as dressed in trousers;
- (b) by Howe as wearing a ‘very nice silk coat<sup>8</sup> with frog-type fastenings, all tapestry like in pink and yellow’, implying it had been used to dress the body. Millet, on the other hand, refers to a ‘red and yellow tapestry jacket’, but in his description the garment was found ‘laid over the body; under this was the shroud and the bindings’.<sup>9</sup> This is a considerable difference;
- (c) by both as being wrapped in a shroud, kept in place with numerous bindings. Both Howe and Millet mention the presence on the shroud of an inscription in Old Nubian ‘in the shape of a cross’ (Howe locates it on the deceased’s chest, Millet writes that the inscription ‘covers the head end of the shroud’) (Plate 8.3);
- (d) by both as then wrapped in two large silk panels<sup>10</sup>;
- (e) by both as being covered by a printed quilt, the last textile layer placed in the coffin, which according to Millet had been stitched to the upper layer of silk;
- (f) by Millet as being accompanied by a pair of leather slippers, apparently placed in the foot end of the coffin, under the quilt and not in the shroud itself. Howe does not mention these slippers in her description;

<sup>8</sup>See Cairo, 1969, no. 251, Pl. 46a; Mackie, 1984, Pls. 2–3; Baker, 1995, colour pl. on p. 78.

<sup>9</sup>The object register also mentions that the coat was found under silk and covered the body, while the trousers are described as ‘worn’.

<sup>10</sup>For their preliminary publication see exhibition catalogue Cairo, 1969, no. 262, Pl. 45; Mackie, 1984, Pl. 7; *ead.* Mackie, 2015, 259, colour pl. 7.14.

Table 8.4 Data for burial vault B

Vault B			
Date	Field notes and drawings (KRW=Kent R. Weeks)	Excavation journal (NBM = Nicholas B. Millet)	S.L. Howe private correspondence <sup>a</sup>
02.01.1966	Body 'A' was removed from vault at close of work yesterday. Vault is being cleaned and blocked door at E end will be opened. Clearing of church continues. S. Howe reports that fresco on wall of NE corner of church is applied over an earlier layer of painted plaster. Removal of mud-brick in vault which blocks its entrance at the E end reveals a small chamber containing a <b>large wooden coffin</b> tied with <b>rope</b> , and a small live mouse. The way in which this brick seal was laid clearly indicated that the entrance to the vault containing burial 'A' was at the east and that the seal was placed from the E side. PLAN EAST END, CH IV	Weeks has found another vault containing a <b>well-made wooden coffin bound round with rope</b> .	
03.01.1966		The coffin burial in the vault beneath Ch.4 is beneath a secondary vault built below the main one, rather to the n. of centre.	
04.01.1966	Excavation of subfloor vault continues. Vault from which wrapped body came has been designated 'A'; new vault with coffin is 'B'. PLAN + SECTION		

(continued)



Table 8.4 (continued)

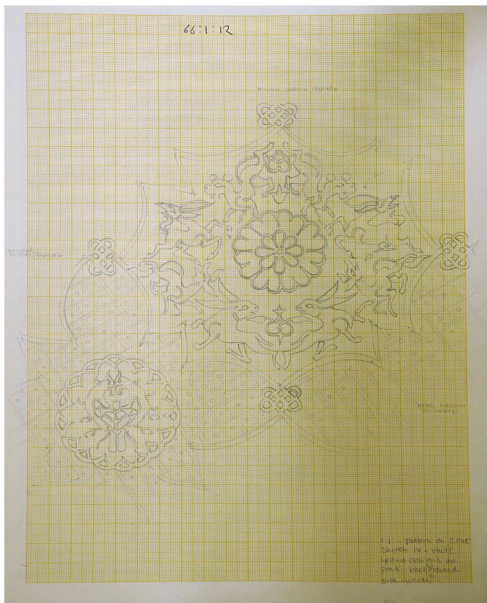
Vault B		
Date	Field notes and drawings (KRW=Kent R. Weeks)	Excavation journal (NBM = Nicholas B. Millet)
05.01.1966	<p>Are cleaning &amp; removing coffin from vault B of church IV.</p> <p><b>Coffin</b>, of wood, was very well-preserved &amp; tied with <b>palm fibre rope</b>. Lid of coffin was broken. Inside, body is <i>wrapped</i> in a <b>quilt</b> or cloth on which are painted or dyed designs.</p> <p>PLAN + SECTIONS</p> <p>Coffin lid &amp; sides were drilled, tied together.</p> <p>Coffin is of four pieces: Lid, ends (2), side &amp; bottom. At least <b>one portion of coffin interior was lightly whitewashed and inscribed in old Nubian (?)</b>.</p>	<p>S.L. Howe private correspondence<sup>a</sup></p> <p>We uncovered the <b>wooden coffin</b> with a burial in it under the church. The coffin is now in the work tent, about six feet long, hollowed out of a log, very nicely made. <i>On top</i> was a beautiful <b>red and white and blue floral printed quilt</b>, and <i>under</i> that some really lovely <b>silk material all gold and green, red and blue stripes with decorative bands in Kufic with birds, gazelles and rabbits</b> woven into them. Very well preserved, <b>two huge pieces</b>. There was a <b>wooden nameplate</b> or sign <i>tied</i> to the body which was all <i>wrapped up in linen</i> and <i>bound</i> with numerous <b>knots and bandages</b>. The name plate is mostly covered with rat shit as we call it—rats have ruined so much here (...) anyway the names were all in a Greek form; then the body—a man about 25—beautiful set of teeth. He's <i>wearing</i> <b>pantaloons</b>, with feet, yet and a very nice <b>silk coat with frog-type fastenings, all tapestry-like in pink and yellow, woven with more gazelles, roses, dogs, rabbits and parrots</b> (or some fancy type of bird anyway). And best yet, <i>over the body wrappings</i> on his chest in a <b>cross-shaped pattern was a perfectly preserved old Nubian text</b> which Nick is now translating.</p>

15.01.1966		<p>I should say that the shroud inscriptions of <u>the</u> burials in crypts B and C of Ch. 4 give the name of the deceased at the very end of each case, but no title or filiation. [...] the name of <u>the</u> 'coffin burial' in C was [transcription Gapoiapa], the other [transcription Komar] or just possibly [transcription Iomar].</p>	
------------	--	--	--

"Quoted after personal correspondence of S.L. Howe, who worked as draughtswoman in the last Gebel Adda season. Mrs. Howe sent a typed copy of the letters she had sent to her family during the excavations to Dr. Nicholas Millet in 1978, that is 13 years after the last campaign. The quoted extracts relate only to archaeological evidence and do not disclose any personal content



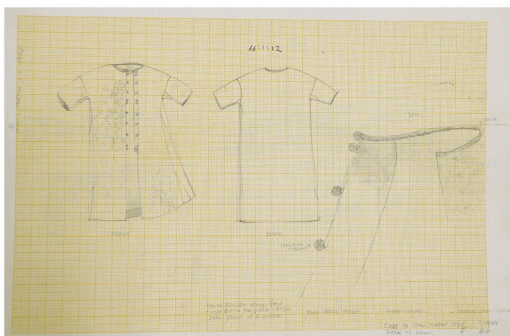
Gapoiapa's dress reconstruction (objects a & b).  
Drawing by S.L. Howe, 15.01.1966



Pattern detail of Gapoiapa's coat (object b)  
Drawing by S.L. Howe, no date.



Gapoiapa's trousers (object a)  
ROM 973.24.3481  
Photograph ROM.



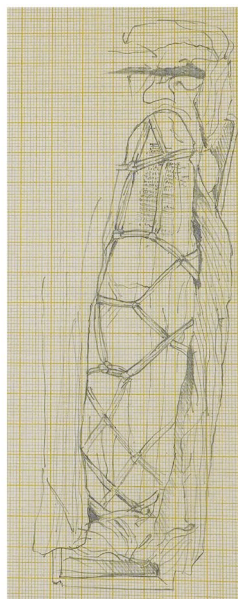
Top: Gaopiapa's coat (object b), face, back and  
detail of collar.  
Drawing by S.L. Howe, 10.01.1966



Left: Gapoiapa's coat (object b) inv. 23903 on  
display in Nubia Museum, Aswan.  
Photograph MMW, Courtesy of Nubia Museum,  
Aswan.

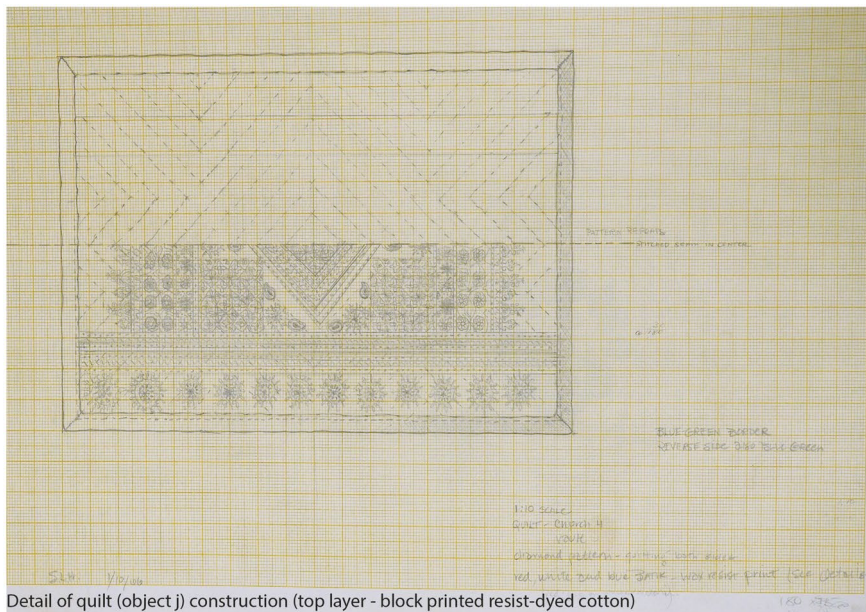
All drawings by S.L. Howe, Gebel Adda Archives, Courtesy ROM

**Plate 8.2** Gapoiapa's coat and trousers. Left (top) Reconstruction of Gapoiapa's dress (objects a & b) by S.L. Howe. 15.01.1966. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum); (low) Gapoiapa's trousers (object a) ROM 973.24.3481. (Photograph © Royal Ontario Museum). Right (top) Pattern detail of Gapoiapa's coat (object b) drawn by S.L. Howe, no date. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum); (middle) Gapoiapa's coat (object b)—face, back and detail of collar drawn by S.L. Howe. 10.01.1966. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum); (low) Gapoiapa's coat (object d) on display, inv. 23903. (Photograph MMW, Courtesy of Nubia Museum, Aswan)

[illegible]

**Plate 8.3** Documentation of the inscribed shroud of Gapoiapa. Left: Gapoiapa's coffin during unwrapping. (Photograph by W. Kołataj, after Żurawski 2014, 133, fig. 16). Right: Drawing of Gapoiapa in his shroud during the unwrapping by S. L. Howe, not date. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum). Low: Extract of the Object Register with provenance and drawing of the inscribed fragment. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum)





Detail of quilt (object j) construction (top layer - block printed resist-dyed cotton)

Drawn by S.L. Howe 10.01.1966

Gebel Adda Archives, Courtesy ROM.



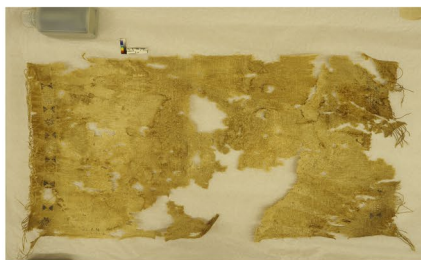
Detail of the quilt's top layer.

Drawn by S.L. Howe, no date.

Gebel Adda Archives, Courtesy ROM.



Detail of silk 23900 - object g (silk panel) or j (quilt's silk layer).  
Photograph MMW, Courtesy of Nubia Museum, Aswan.



Mappa (object c). ROM 973.24.2898.

Photograph MMW, Courtesy ROM.

**Plate 8.4** Gapoiapa's quilt and mappa. Top: Detail of quilt's construction (object j) drawn by S.L. Howe. 10.01.1966. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum). Left (low): Detail of the quilt's top layer (block-printed pattern) drawn by S.L. Howe, no date. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum). Right (middle): Detail of silk inv. 23900 (object g or j). (Photograph MMW, Courtesy of Nubian Museum, Aswan). Right (low): Mappa (object c) ROM 973.24.2898. (Photograph MMW, Courtesy Royal Ontario Museum)

- (g) by Howe as having a ‘wooden nameplate or sign tied to the body, which was all wrapped up in linen and bound with numerous knots and bandages. The name plate is mostly covered with rat shit (...)’. In the excavation journal this object is described as ‘a plastered panel’ found ‘on the outside of the quilt, under the coffin-lid, at about knee height. It bears a long inscription badly obliterated by mouse dung’ (Millet)<sup>11</sup>;
- (h) by the object register, under entry 66:1:14, as also being found with a linen kerchief, which is not mentioned by either of the excavators. The provenance indicates it was found ‘on body (worn)’.

This quick résumé of the burial’s layout shows that, despite the richness of its furnishings and the quantity and quality of the field documentation, the reconstruction of the layers remains partly uncertain because of contradictory information given by Howe and Millet concerning the location of the coat. The slippers are mentioned only by Millet and neither of the excavators mentions the linen kerchief.

Also, another interesting detail appears in the entry for 15 January, where Millet briefly discusses the decipherment of the Old Nubian inscriptions from church 4: he writes clearly about this coffin burial and the one discovered earlier, but instead of describing them as burials from vaults A and B, he refers to ‘crypts B and C’. In the field documentation, however, the drawings referring to these burials are labelled ‘vault A’ and ‘vault B’. The confusion in the crypts’ labelling by Millet is also visible in the sketch plan from 30 January 30, where he initially located vault ‘A’ in the eastern part of the church, then corrected it to ‘C’. This invites us to consider all the documents with great caution, and once again shows the need to cross-check all the possible references to rectify such errors (Table 8.5).

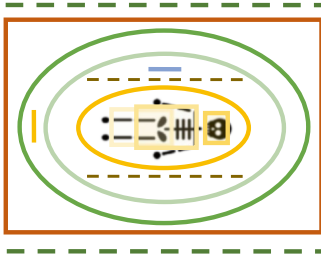
---

<sup>11</sup> This object is kept in the collections of the ROM, but was not examined by the author. The dimensions given in the object register are 30 × 10 cm. A drawing of this wooden plaque with drilled holes and a few lines of text is preserved in the archives, where it is identified by the registration number ‘66:1:27’ and its provenance is clearly marked ‘Cit. Ch.4 Vault, in Coffin’. A tentative transcription of the text was made by Millet (archives: Inscription N° 52—Wooden Panel from Burial in Crypt C, Church 4), but was never published. Interestingly, the plaque was also inscribed with at least one line on the reverse, which does not appear in the drawing. The inscription is currently being studied by Adam Lajtar.



**Table 8.5** Object inventory from burial vault B and visualization

Burial layers <sup>a</sup>	Object description	Textile concordance	Present location
a)	Cotton trousers (dressed on body)	Register 66:1:13	ROM 973.24.3481
b) ?	Silk coat (dressed on body?)	Register 66:1:12	Aswan, Nubia Museum
c) ?	Linen <i>mappa</i> (on head?)	Register 66:1:14	ROM 973.24.2898
d)	Shroud with inscription	Register 66:1:8	Unknown
e)	Bindings	Not registered	Unknown
f)	Wooden nameplate	Register 66:1:27	ROM 973.24.891
g)	Silk textiles (2) with golden threads (wrapped around body)	Register 66:1:11	Aswan, Nubia Museum
h)	Red leather slippers	Register 66:1:9	ROM 973.24.2704
i)	Quilt made from a block-printed resist-dyed textile lined with silk textile with golden threads (wrapped around the body)	Register 66:1:10 (quilt of red print cotton) and 66:1:11 (two lengths of multi-coloured silk with gold threads)	Unknown (printed cotton layer); Aswan, Nubia Museum (silk textile).
j)	Wooden coffin	Not registered	Unknown
k)	Palm fibre rope	Not registered	Unknown



<sup>a</sup>In order from innermost (body) to outermost. I follow here S.L. Howe’s description

**8.2.3 Burial in Vault C**

Vault C was empty (Table 8.6).

**Table 8.6** Data available for burial vault C

Vault C = empty		
Date	Field notes and drawings (KRW=Kent R. Weeks)	Excavation journal (NBM = Nicholas B. Millet)
03–04.01.1966	<u>Floor has been cleared in S part of Church to enable opening vault ‘C’ from the top.</u> Vault lies immed. under floor. It was at one time broken open & partially resealed with mud-brick. Photo 3020. PLAN + SECTION	

**Table 8.7** Data for burial vault D

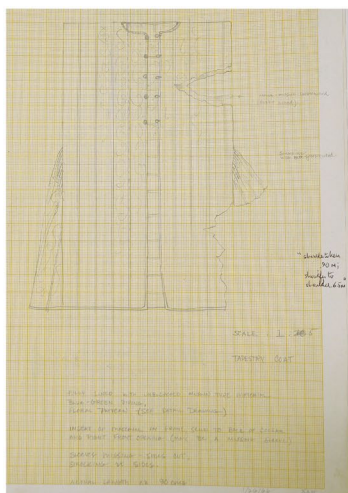
Vault D		
Date	Field notes and drawings (KRW=Kent R. Weeks)	Excavation journal (NBM = Nicholas B. Millet)
06–10.01.1966	Excavation below the Church’s fired red-brick floor continued during 6–10 January 1966. <u>Beneath the floor in the NW part of the Church a large, unvaulted crypt</u> was cleared. It was filled to floor level with many well-preserved fresco fragments. <u>The E. end of the crypt (called Crypt ‘D’)</u> was covered with mud-brick at ca. 50 cm and the W. end of this was blocked with mud-brick. Bricks were 36×16×6. Beneath was a ‘chamber’ covered with <b>reed matting</b> supported by <b>small wooden pole-rafters</b> . Inside, the body was <i>wrapped</i> in <b>linen</b> and a <b>quilt</b> . PLAN + SECTION	[06.01.1966] Ahmed Ali clearing the nave ‘vaults’ of Ch. 4. There is at least one more quilt burial here. [08.01.1966] The quilt burial in <u>crypt D</u> of Ch. 4 is high above the floor; the vault is gone, having been removed when the house was converted into a church, and its function served by short strong cross walls under the floor. The burial was made in a <b>m.b. [mud-brick] box, short wooden beams</b> over it to support the weight above, then <b>angarib-work and matting</b> . The <b>quilt</b> is red in colour on the visible side. The whole quilt, bones and <b>shroud (uninscribed)</b> moved in one operation and sent to the work tent. The body from the new crypt had been supplied with a <b>paper amulet</b> bearing an inscription in ON, which the mice had used to make nets with inside his chest. A fragment of the string was found, but it was uncertain whether the amulet was at neck or wrist. There may of course have been two. Abdel Muiz came this afternoon to work on the textual textile.

### 8.2.4 Burial in Vault D

The data available for burial vault D are compiled in Table 8.7. Textiles are shown in Plates 8.5 and 8.6.

The disposition of the body and the textiles in this burial is similar to the one in vault A. The body was:

- wrapped in a linen shroud;
- then in a quilt;
- and laid on a wooden bed (*angarib*) and matting.



Coat (object b), front.  
Drawing by S.L. Howe 26.01.1966  
Gebel Adda Archives, Courtesy of ROM



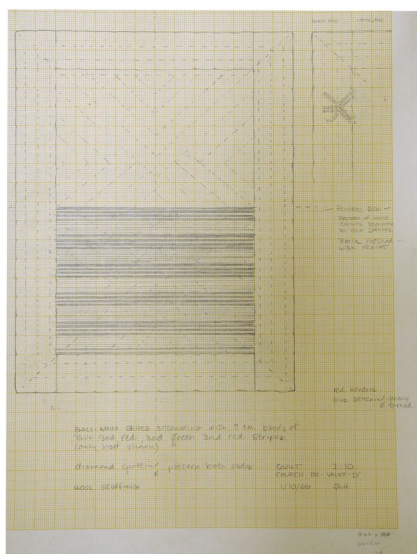
Left: Fragment of coat (object b) ROM 973.24.2906  
Photograph MMW, Courtesy ROM  
Right: Coat 23904 (object b), Nubia Museum, Aswan  
Photograph MMW, Courtesy Nubia Museum



Coat (object b)  
Scan of photograph negative. Gebel Adda Archives, Courtesy of ROM

**Plate 8.5** Coat from burial vault D. Top (left): Drawing of coat (object b) by S.L. Howe. 26.01.1966. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum). Top (right): Fragment of coat (object b) ROM 973.24.2906. (Photograph MMW, Courtesy Royal Ontario Museum and Coat inv. 23904 (object b) on display in Nubia Museum, Aswan. Photograph MMW, Courtesy Nubia Museum). Low: Scan of photograph negative showing coat (object b) before display. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum)

The object register provides two entries for this burial: 66:1:35 (a quilt) and 66:1:70 (a coat). While the quilt is briefly described ('red in colour on the visible side'), the coat is not mentioned in the field documentation, nor in the excavation journal. The register indicates that the garment was given to the Museum of Islamic Art, Cairo; however, a fragment is still preserved in the ROM collection (inv. 973.24.2906). The drawing documenting the piece in the object register represents it as almost complete and in shape, without sleeves. The dimensions are 90 cm in length (from shoulder to hem) and 65 cm in width (from shoulder to shoulder). However, the coat as it is today displayed in Nubia Museum, Aswan, appears flattened and misshapen,



Quilt (object d) construction  
Drawn by S.L. Howe 10.01.1966



Quilt (object d) - resist-dyed cotton layer ROM 973.24.2901.6  
Photograph MMW, Courtesy ROM



Quilt (object d) - striped silk layer ROM 973.24.2901.1  
Photograph ROM

**Plate 8.6** Quilt from burial vault D. Left: Drawing of quilt's construction (object d) by S.L. Howe. 10.01.1966. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum). Left (top): Resist-dyed cotton layer of quilt (object d) ROM 973.24.2901.6. (Photograph MMW, Courtesy Royal Ontario Museum). Left (low): Striped silk layer of quilt (object d) ROM 973.24.2901.1. (Photograph Royal Ontario Museum)

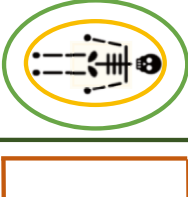
with the stitches of the side seams seemingly cut so that its front and back are now only joined at the shoulders, and one of its lower panels now turned sideways and resewn across the front opening of the coat. The question arises as to the state of this garment at the time of its finding: was it worn by the deceased, or was it already partially disassembled and flattened to be reused as an additional covering layer? A series of film negatives documenting the objects left in Cairo preserves two negatives (2A and 3A) of the coat laid on a table: although its lower left front panel is already missing (presumably kept by Millet's expedition), the coat still retains its initial shape (Plate 8.5).

A third fragment of textile is identified in the ROM collection as having been found in vault D, namely a rectangular piece of cotton with a dark red round stamp (inv. 973.24.3482). The textile had been cut from a bigger piece, and two of the corners retain pleats indicating that the fabric was tied (Plate 8.5). There is no information about this object in the field notes.<sup>12</sup> Although the description of the burial mentions a linen shroud, it is not impossible that the fibre was, in fact, cotton.<sup>13</sup>

<sup>12</sup> For this reason, I do not include this piece in the final inventory.

<sup>13</sup> All the shrouds from burials in church 4 are systematically described as linen, but the examination of two shroud fragments from other richly furnished burials from Gebel Adda (one from Cemetery II, the other from Church VII) has positively identified them as cotton textiles (<http://nubia.iksiopan.pl/en/entry/welcome-to-the-nubian-textile-database-bd468d2c6b80>).

**Table 8.8** Object inventory for burial vault D and visualization

Burial layers <sup>a</sup>	Object description	Textile concordance	Present location
a)	Paper amulet <sup>b</sup> (on body)	Not registered	Unknown
b) ?	Coat <sup>c</sup> (on body?)	Register 66:1:70	Aswan, Nubia Museum
c)	Shroud <sup>d</sup> (not inscribed)	Not registered	Unknown
d)	Quilt made of a resist-dyed red cotton textile layered with a striped silk textile	Register 66:1:35	ROM 973.24.2901.2
e)	Reed mat	Not registered	Unknown
f)	<i>Angareb</i> (bed)	Not registered	Unknown
			

<sup>a</sup>From innermost (body) to outermost  
<sup>b</sup>The paper amulet is not registered but is mentioned in the excavation journal  
<sup>c</sup>The coat is mentioned in the register, but not in the excavation journal; in the ROM’s textile inventory it is attributed to vault burial A (Komar)  
<sup>d</sup>The shroud was probably held tight with bindings; although this is almost certain, their presence is not mentioned in the field documentation, and I chose not include them here to avoid creating false data

This fragment could have been cut from the shroud, because of the presence of the stamp. Another possibility is that the fragment was used to cover the deceased’s face before wrapping the body in the shroud. However, neither of these hypotheses can be firmly supported by the available documentation (Table 8.8).

**8.2.5 Burial in Vault E**

Vault E was empty (Table 8.9).

**Table 8.9** Data available for burial vault E

Vault E = empty		
Date	Field notes and drawings (KRW=Kent R. Weeks)	Excavation journal (NBM = Nicholas B. Millet)
06–10.01.1966	<u>Vault ‘E’, lying beneath altar area, was empty.</u> PLAN + SECTION	<b>09/01/1966</b> <u>Crypt under the sanctuary of Ch. 4</u> well-built and clean and seems to be absolutely empty. [...] <u>Vault Da under sanctuary of Ch. 4</u> is indeed empty.

<sup>a</sup>As discussed previously, in the field documentation produced by Weeks the vault is described as “E” while Millet in the excavation journal describes the vault as “D”

**Table 8.10** Data for burial vault F

Date	Field notes and drawings (NBM = Nicholas B. Millet)	Excavation journal (NBM = Nicholas B. Millet)
No date	Church 4 notes <del>North aisle</del> nave PLAN 1:20 [bears indication] ‘burial 1. <b>Quilt, wrappings opened</b> , bones scattered’ Notes: W. Cross wall. E. Cross wall built on rubbish at –0.75 m to datum Burial 1 on rubbish at –0.50 m <b>Green-dyed sheepskin</b> at –0.90 m, in pit in dakka, earlier than cross wall. <u>Should be vault ‘F’ between D and E</u>	
26.01.1966		Found <b>two much disturbed burials in rubbish in ‘crypt E’<sup>a</sup></b> of church 4, and another <b>small tapestry work coat, red and green</b> .
27.01.1966		Weeks resumed work in Temple Ch. 4. [...] The floor and <b>crypts D-E</b> of Ch. 4 are being given a final cleaning.
30.01.1966		Carried out final cleaning of <b>crypts D, F, E</b> .

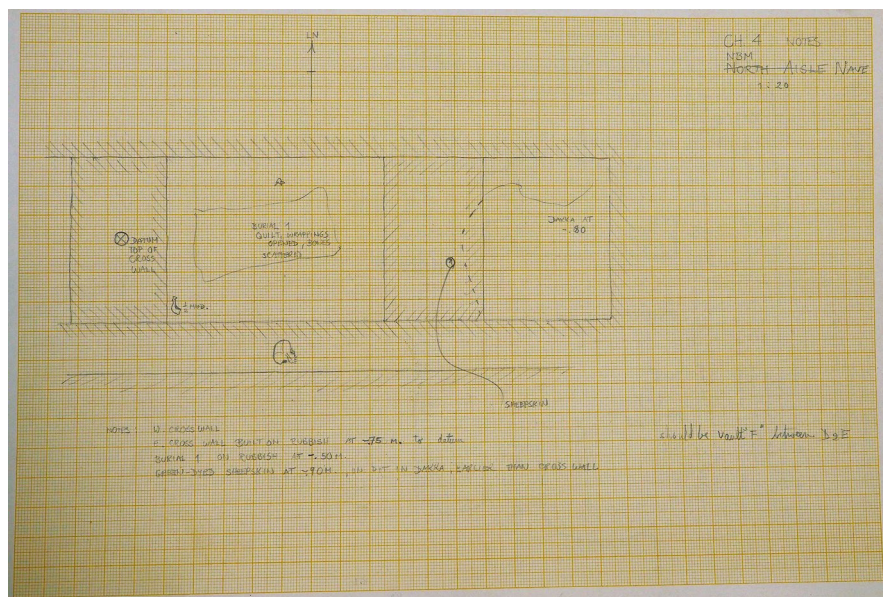
<sup>a</sup>It again appears that in the field documentation and the excavation journal the vault is described differently: Weeks calls it “vault F” while Millet uses “crypt E”

### 8.2.6 Burial in Vault F

The data available for burial vault F are compiled in Table 8.10.

The excavation notes available for this burial were recorded by Nicholas Millet. From the excavation journal, we know that Weeks was away for a few days, probably from Sunday 23 January to Wednesday 26 January, as he resumed work in church 4 on 27 January. Millet supervised the excavation during Weeks’ absence.





**Fig. 8.5** Scan of the field drawing documenting burial in vault F by N.B. Millet. (© Gebel Adda Archives, Courtesy of the Royal Ontario Museum)

The comparison of the field notes and the data given in the excavation journal is not easy to interpret. On the drawing (Fig. 8.5), the area of ‘Burial 1’ is clearly marked and contains a short description indicating that the burial was indeed disturbed (‘wrappings opened, bones scattered’), which is also mentioned in the excavation journal in the entry for 26 January. However, the locale of the second burial is not clearly given, nor mentioned in the field notes. It is, however, possible that the presence of this second body is indicated by the skull and half mandible drawn outside the area of burial 1.

The textile concordance process is, in such circumstances, difficult to reconstruct. In the field notes, Millet clearly mentions body wrappings and a quilt, but there is no information about any ‘tapestry coat in red and green’ referred to in the excavation journal. The object register has three entries related to ‘Cit. Ch IV, Crypt E. [=East]. end N. [=North] Aisle’: a fragment of shroud with the Arabic word ‘*baqi*’ (66:3:4) left in Cairo, a ‘brocade inset of burial quilt’ (66:3:37) in the ROM collection today (973.24.3483), and three fragments of a manuscript in Old Nubian (66:3:62). The ‘brocade inset’ is decorated with medallions with floral patterns in green and gold, but in many places the green surface is badly discoloured, and many gilded membrane threads have lost their gilded surface and are now reddish brown. We can only speculate if the state of preservation of the textile at the moment of its discovery would have led Millet to describe it as ‘red and green’. Finally, the date of the find given in the object register is 3 March for all the objects, but we know that the excavation of crypt F ended on 30 January. While the use of the terms ‘shroud’ and ‘burial quilt’ confirms the funerary context of the find, there is no mention of any burial excavated at the beginning of March 1966.

### 8.3 Reconstructing Burial Practices

The adoption of Christianity in the Nubian kingdoms was a top-down process, and probably took several decades, or even a century or two, to reach the lowest levels of the Nubian population. The influence of the new faith is, nevertheless, observable through the change of burial type, although the exact chronology of this phenomenon is too intangible to trace precisely. While their pagan ancestors were buried in burials composed usually of a shaft leading to the funerary chamber, the whole topped with an artificial mound, the Nubian Christians were buried in ‘box graves’, as labelled by archaeologists—that is rectangular pits placed in rows, delimited and framed by stones. Another change of practice commonly observed is the absence of grave offerings in Christian burials (at least in the large rural cemeteries excavated so far).<sup>14</sup> Finally, the body of the deceased was dressed in clothes before being wrapped in a shroud. Admittedly, the number and nature of the garments, as well as the quality of the shroud, were variable, reflecting the deceased’s wealth and status. In the most modest burials, only traces of a loincloth, if preserved, are recorded (Adams, 1999). Often the shroud itself was made from smaller pieces of reused textiles sewn together. Close examination of the fabrics usually shows traces of wear, proving these were items the person wore or used during his or her lifetime. In Medieval Nubia, as in the previous period, textiles were still a valuable commodity; however, the various functions they fulfilled in the funerary rituals have not been deeply studied.

This question is, in fact, difficult to investigate because there are but few sources of information for the perception and treatment of death in Medieval Nubia. Because Makuria was a Christian kingdom, it is tempting to assume that Nubian death rituals were probably like those in European Christian tradition. However, as iconography amply demonstrates, the rulers of Medieval Christian Nubia embedded their own original conceptions of divine kingship into religious art, creating a unique syncretism between Nilotic (African) and Christian traditions (Wozniak, 2016). It is therefore important to keep in mind that these multiple traditions were probably also blended into funerary practices.

Coming back to our case study, we can note that, despite the varying state of preservation of the elite burials from church 4 at Gebel Adda, at least two constant elements are present in all the crypts: wrappings enveloping the body and a ‘quilt’ covering it. We can add a third element, absent from crypt F which was greatly disturbed but present in the three other burials, namely a rigid support which served to (display? and) transport the body to its final resting place (a reed mat, a coffin, or a wooden bed). Thus, we can, in fact, distinguish at least three main stages in the funerary process.

---

<sup>14</sup> In one of the richest Christian graves in terms of textile equipment (burial 1039), from Cemetery II at Gebel Adda, a water jug and bronze cup were retrieved (van Gerven et al., [forthcoming](#)). Vessels and lamps were also attested in the crypts at Old Dongola (Godlewski et al., 2012; Mahler et al., 2015).

### 8.3.1 *Wrapping the Body*

As discussed above, from the currently available documentation we cannot be certain that the body was dressed in clothes, except for Gapoiapa who was dressed in trousers (and perhaps a coat). What is certain, however, is that the body was enveloped in a large piece of cotton textile, plain, with no decoration. In two cases—burials A (Komar, an adult woman) and B (Gapoiapa, a man aged about 25)—this textile was inscribed with a text in Old Nubian using language of a magico-religious nature (Millet, 1967). In at least one instance, the text was carefully arranged in the shape of a cross (Gapoiapa), which indicates that the text was probably written on the textile while it was placed on a flat surface, before the wrapping stage.<sup>15</sup> Yet the location of the text was not chosen hazardingly; it was probably planned by the scribe in consultation with the persons responsible for wrapping the body, so the text would appear on a specific area of the body (head and chest) once in place.

Recently, Łajtar and van der Vliet (2017) published a monograph dedicated to the study of a Medieval funerary complex in Dongola. The core of their book is the editing and translation of an inscribed burial vault located under the commemorative chapel of Georgios, bishop of Dongola, probably painted around the year 1100. Łajtar and van der Vliet offer a tentative reconstruction of the Makurian office of the dead, in which the Virgin Mary occupied a central place.<sup>16</sup> In their interpretative chapter, they also describe the internal spatial functioning of the textual ensemble within the burial vault where they underline its apotropaic character, comparing it to an inscribed shroud, protecting the deceased.

Based on this, it may be assumed that the general purpose of the protective texts written on the shrouds of both Gapoiapa and Komar was to help the deceased reach heaven, through the intercession of the Virgin Mary, to whom the prayer was addressed. The incantatory tone of the funerary text inscribed on the shroud (van Gerven et al., forthcoming) may indicate that it was pronounced over the body, which would explain why it had to be visible to the audience (or at least to the person reading the prayer). Finally, the wrapping process included another step, namely the tying of the body with flat narrow woven bindings. We can infer this from Gapoiapa's burial, where we can see that the bindings partially covered the text inscribed on the shroud (Plate 8.3).

To summarize, the wrapping ritual had several functions: to envelop the body of the deceased, separating it visually and physically from the world of the living, and at

---

<sup>15</sup>This preparatory stage certainly included the coating of the textile's surface so the ink would not spread when writing. As the content of the text seems standardized, it could be argued that such a shroud may have been produced in advance, but the addition of the deceased's name still required the intervention of a person able to read and write. The analysis of the text by epigraphists does not suggest any difference in the writing, the presence of which could otherwise have supported such a hypothesis.

<sup>16</sup>They develop an interesting parallel with the Ethiopic 'Prayer of the Linen Garments' whose "opening rites (...) mark the transition from the stage of *séparation* in Arnold van Gennep's famous triplet to the extended marginal period when the dead, newly dressed, assumes the journey of his or her stepwise *agrégation* in the netherworld" (Łajtar & van der Vliet, 2017, 268 and note 60).

the same time, through the presence of the text—probably pronounced over the wrapped body—to provide the deceased with protection for their onward journey into the world of the dead. If applying Arnold van Gennep's classification (van Gennep, 1909), the wrapping served a purpose then both during the separation and reaggregation rites. Through this perspective, the presence of the bindings appears also in a new light. The bindings are usually understood as a practical feature, whose purpose was to hold the body together. However, would a tightly enveloped body need this additional securing, or may we speculate that the ties functioned together with the text as a dual system to prevent the spirit of the deceased returning to the world of the living? While the text invoking the protection of the Virgin Mary and Archangels was recited, providing the deceased with a protective charm that supported him/her in his/her journey to heaven, were the cords bound at the same time, firmly securing the spirit tight to the body before it was transported to the burial? Such a double system to reaffirm the incorporation of the deceased into the world of the dead is worth consideration.<sup>17</sup> While our reconstruction remains hypothetical, it is interesting to observe it fits well with the long tradition of Nubian death rituals as described by the Ethnographic Survey of Egyptian Nubia conducted between 1961 and 1964 (Kennedy, 1978 [2005]). Ethnographers observed that the washing of the body and making of the shroud were the most important preparations, usually conducted by specialists (older relatives of the same sex) (*op. cit.*, 227). "When the ritual washing was complete (...) the shroud, sewn collectively in the mourning area by a group of older men, was put on and tied with three knots (at the feet, chest and head)." After the body was carried to the cemetery, at the moment of the internment "the three knots in the shroud were loosened (...). The body was then sealed into the burial recess with flat stones and filled in". In the collective belief, "the soul of the deceased lingers around the grave for forty days before going to an interim place near either Heaven or hell where it will remain until judgement day" (*op. cit.*, 228). Of course, it is not the author's intention to make the case for a straight parallel between twentieth century CE Nubian death rituals and those of their ancestors from the thirteenth century CE, but it is interesting to note the importance of certain gestures that can be easily overlooked when documenting material practices and trying to understand their function. Moreover, some of the customs described by the Ethnographic Survey team indicate "fear of the spirits and jinn, which are believed to flock around at death" (*op. cit.* 225); these spirits were considered particularly dangerous for some categories of people, such as pregnant women, newly born babies (less than 40 days) or menstruating women, so they were all excluded from any funeral activities (*op. cit.* 229). Such attitudes reveal that, parallel to orthodox religious beliefs, the Nubian community also followed pre-Islamic traditions in which separation rites were applied over a certain period of time to the family of the deceased and his/her relatives, who were "suspended from all productive activity during the mourning period" (*op. cit.* 229). In this light, we gain a better understanding of the need to secure the separation of the deceased from the community of the living, and prompt the reaggregation phase that reconciled the deceased to the world of the dead.

<sup>17</sup>A recent paper by Yvanez et al. (2020) describes a burial from the Medieval period where the deceased was buried dressed in his loincloth, his body bound with strips, but no traces of a shroud were preserved.

In this discussion of the body wrapping, one last element deserves to be mentioned: the possible covering of the deceased's face or head with a piece of textile. Such a practice was recently detected by the author while examining the funerary textiles of a collective burial excavated at Old Dongola.<sup>18</sup> Based on this observation, it can be hypothesized that the *mappa* inventoried in Gapoiapa's burial may have been used in a similar way. Moreover, textile rectangles of a similar size were also found in two other crypts: a red silk in Komar's grave and a piece of cotton with a stamp in burial vault D. This specific treatment of the deceased's body is not mentioned among the practices documented by the Ethnographic Survey, but the archaeological evidence suggests it was an important part of the body's funerary preparation.

### 8.3.2 *Covering the Body with a Quilt*

In all the burial crypts of church 4 at Gebel Adda, the body of the deceased was covered with a richly decorated quilt, assembled from precious textiles such as silk, half-silk, or printed cotton. What was the function of the quilt in the funerary ritual? Again, several options can be considered. It can be assumed that the quilt was an additional separation layer, hiding the body of the dead from the sight of the community of the living, but the choice of high-quality textiles, shiny silks decorated with golden threads and/or vivid shades of red and blue, for the construction of the quilt would rather indicate that its function was to be seen and looked at—during the funerary procession to the cemetery for example? While the high status of the persons buried in church 4 is certain, as expressed by the location of their graves in the church and the rich textiles put in the grave, it is interesting to consider that the important social status they occupied in their lifetime was restored during the funerals, even if their physical body was hidden from sight. From this perspective, it can be hypothesized that the afterlife was perceived by the Medieval Nubian community as a parallel world to the society of the living, so the representatives of the elite would keep their privileged position in the world of the dead. In such circumstances, the deceased was equipped by the community of the living with a luxurious quilt to mark their important position, and thus enter so into the afterlife.

An interesting question for the reconstruction of the funerary ritual is at what moment was the quilt placed on the body? Just after the binding of the body before its transport to the cemetery/church? At the cemetery before the internment? Or at the moment of the deposition of the body in the grave? A careful observation of the position of the quilt in the better-preserved burials shows that the quilt was, in fact, wrapped around the body: the wrapped body was positioned on the quilt and then its edges were tucked over the body. Therefore, it is reasonable to assume that the quilt was laid on the funerary support (reed mat, bed, coffin) before the body was deposited on it. Again, with all due caution, it can be noted that the use of a blanket was also documented by the Ethnographic Survey team: “Men led the procession

---

<sup>18</sup> This documentation was provided to the author by anthropologist Robert Stark (PCMA UW). The results of this research were presented at the 5th Sudan Studies Day — Warsaw Edition (Sept. 2021, online).



while wailing women followed the bier. At the graveside, the body was wrapped in a cloth or blanket, taken from the bier, and lowered into position by two men, protecting it from the view of anyone except those carrying out the actual internment” (Kennedy, 1978 [2005], 228). The description of the blanket’s protective function for the deceased is very interesting, because it reveals that internment is an important moment of transition during which the body could be exposed to harm, probably to the spirits and *jinn*—feared also by the living. The blanket here offers an additional protection, securing the deceased’s safe incorporation into the afterlife.

In the case of Gapoiapa, it is interesting to note that his wrapped body was enveloped in a large, decorated silk, and that another piece of similar silk was used as a liner for the decorated quilt.<sup>19</sup> We can imagine the impressive visual effect of such a combination in the moment of the final covering of the body: the bed (or perhaps already the coffin?) draped in the quilt with its silk lining, and the body wrapped in the same silk placed on the bed (or in the coffin). Then, the edges of the quilt laid on the bed/coffin were raised up and the vivid red and blue upper layer was revealed, before covering the body of Gapoiapa in his final resting place. Different scenarios can be imagined, but in the case of Gapoiapa, it is important to note that the wrapped body was placed in a coffin covered with a lid, carefully bound with a cord, so in the final moment of his internment, nothing but the coffin was probably visible.

While the situation with the quilt(s) in Komar’s burial is not clear, in crypt D the way the quilt was displayed caught the attention of the excavators. It was constructed with a large panel of striped silk on one side and backed on the other side with narrower panels of cotton tabby, resist-dyed in deep red (Plate 8.6). While we tend to consider silk a more valuable fibre than cotton, it is interesting to note that the quilt was in fact wrapped around the deceased with the red side (cotton) facing outwards, visible to the participants attending the funeral. This method of display finds an interesting echo in the Ethnographic Survey. The Nubian informants explained to the researchers that “[w]hen the deceased was a woman the arches [that is the palm branches fixed on the *angareb*] were draped with red cloth, since it was felt that the feminine shape of a woman should not be visible to the crowd as the biers moved toward the cemetery” (*op. cit.* 227). Interestingly, while the function of the red cloth is to conceal the feminine shape of the body, at the same time its colour visually communicates the identity of the deceased as a woman. Unfortunately, we have no information about the sex of the skeleton buried in crypt burial D, but the presence of the red quilt, noticed by the excavators, may be an interesting feature to consider. Another remarkable fact is the use of striped silks in all the burial vaults: shall we consider stripes as a fashionable pattern at that time, or was this specific decoration the reason for which these textiles were chosen?

As we see, many questions remain unanswered, but such a deployment of richly decorated and shiny textiles remains a strong argument in favour of a scheme in which part of the funerary rituals were conducted in the presence of a (privileged?) part of the community.

---

<sup>19</sup>It is impossible to say if this was only a coincidence (availability of such a quilt at the moment of death) or if the choice of similarly decorated textiles was made on purpose for aesthetic and/or ritual purposes (which would imply that the quilt was deliberately assembled from textiles chosen for funerals).



### 8.3.3 *The Procession to the Graveyard*

While the rigid support on which the body was transported to the graveyard was not made from textile, we saw in the previous section that it was probably strongly linked with the quilt which enveloped the body. The archaeological evidence from the crypt burials attests three different options for the material constituting the bier of the deceased, and each of them offers an interesting insight into the funerary rituals.

In burial crypt A, the wrapped body of Komar was laid on a reed mat, which could be described as the most simple and modest furnishing attested in the burials from church 4 (Plate 8.1). The use of such furnishings may appear quite surprising for the burial of an important figure in Gebel Adda society, but it is worth remembering that such mats were also found in multiple burials in crypts under the memorial complex of Bishop Georgios at Old Dongola (Godlewski et al., 2012; Mahler et al., 2015). A closer look at the Nubian death ceremonies documented in the Ethnographic Survey also offers interesting paths for the interpretation of the presence of reed mat (plaited from palm leaves) in Komar's grave. Indeed, green palm sticks appear at different occasions between the announcement of the death and the burial ceremony, as well as in post-burial rituals. They are used by older women of the family during the death dance, performed in the courtyard—not only do they distinguish the family of the deceased, but they are said to have a protective role as well, especially against spirits and threatening beings. At the moment of burial, the body is transferred to an *angarib* (bed) “which had been transformed into a bier by arching palm branches over it at the head and the foot. (...) Green palm fronds were said to please the soul of the dead person, alleviate his suffering and ‘light’ his way; they also acted as a prayer to the spirits to allow the survivors to keep his house ‘open’” (*op. cit.* 227). Later, during yearly feasts, water, palm leaves, and food are offered to the soul of the deceased by placing them on the grave. The use of palms in the funerary rituals was also attested earlier during the nineteenth century CE: “two large palm leaves are stuck into the ground at either extremity [of the grave]” (Burckhardt 1922, 28; Edwards 1891, 254 cited in Kennedy, 1978 [2005], 232)—such a tradition can still be observed today. In this light, the mat made of palm leaves (described as “reeds” by the excavators) in Komar's grave was not a piece of a cheap support quickly assembled for the funeral, but rather a powerful apotropaic device purposefully accompanying the deceased woman.<sup>20</sup>

<sup>20</sup> The drawing made by S.L. Howe in fact shows a 5 cm wide strip, tightly and regularly plaited in a chevron motif. It is possible that the ‘reed mat’ was in fact assembled from several strips sewn together, a practice still observed today. Traces of sewing are also visible on the drawing, pointing to an additional layer (of textile?) possibly sewn onto the mat. A fragment of black and white band, also drawn by S.L. Howe and described as found under the mat (Pl. 1, object e), could be considered a possible addition to the mat.

Gapoiapa was inhumed in a wooden coffin, which was indisputably an expensive item, because wood had always been a scarce material in the Nilotic environment. The use of a coffin, which completely hides the richly wrapped body from the sight of the funerary procession, is a rather uncommon addition to the inhumation ritual. As we discussed above, the sophisticated wrappings enclosing Gapoiapa's body are a strong visual manifestation of the deceased's privileged status, and point to the presence of an audience in front of which these magnificent textiles were displayed. Yet the closing of the coffin with a lid, fixed into place by tight bindings along its entire length seem to point to a different aspect of the funerary ritual. Rather, such preparation is indicative of a long journey to transport the body to its resting place. We can only hypothesize that, for an unknowable reason, part of the funerary ceremonies, including the display of the wrapped body covered with silks, took place in a second location deemed far enough away from Gebel Adda to require the body to be placed in a coffin, its lid firmly tight, in order to ensure the deceased's safe transportation and deposition in the crypt of church 4.

In crypt D, the construction of the burial chamber was apparently specially designed ('a mud brick box, short wooden beams over it to support the weight above') to receive the funerary bed. This demonstrates that the place was chosen and prepared on purpose in advance. As in crypt A, the deceased was laid on a reed mat, but not directly on the ground; instead, the body was resting on an *angareb* (bed). The use of a bed transformed into a bier 'by arching palm branches over it at the head and foot' is well attested in the Ethnographic Survey (Kennedy, 1978 [2005], 227). However, the bed-bier is used only to transport the body of the deceased to the cemetery, it is not deposited as part of the burial. Interestingly, we read that "the bed upon which the deceased had been carried to the cemetery could not be taken back inside the house immediately because it would bring the destructive effects of *mushahara*<sup>21</sup> to the family. It was left outside in the street until the new moon, as '[e]very month comes with new events'" (*op. cit.* 228). The practice documented by the Ethnographic Survey indirectly attests to the material value of the furnishing—here the *angareb*—which remains in use by the family of the deceased. The fact that the wooden bed was left in the crypt burial is indicative of the important social and material status of the deceased. It could also reflect a reinforced strategy contributing to the separation of the deceased from the living. With the bed sealed in the burial, it no longer acted as an intermediary material element between the world of the dead and the world of the living, meaning there was no need for a special separation rite (such as leaving the bed outside for a specified length of time).

---

<sup>21</sup> On this concept (crisis rites intended to protect people in a temporary state of sacred vulnerability) see Chap. 7 by J.G. Kennedy in *Nubian Ceremonial Life* Kennedy, 1978 [2005], 125–150.

## 8.4 Concluding Remarks

The tentative reconstruction of funerary rites based on the archaeological and archival documentation of the Gebel Adda crypt burials, and supplemented by ethnographic information, sheds light on at least three steps of the preparation of the body between the moment of death and inhumation. The probable washing of the body and its enveloping in a plain, undecorated shroud, sometimes inscribed with a protective prayer; the placement of the body onto a funerary bed covered with a precious quilt, which was then wrapped around the body of the deceased; the transportation of the wrapped body to the grave and its inhumation. In each of these phases, textiles played both a practical and a ritual function, carefully manipulated by the living to accompany the deceased into the afterlife.

The preparation of the body might have been ensured by the deceased's close relatives, limited in number, in the private and closed context of the house. The use of an inscribed shroud, with an appropriate prayer augmented with the personal name of the deceased, points to the intervention of an external actor, namely a scribe. The practicalities remain unknown, but it can be hypothesized that the cotton fabric piece was chosen from the family's possessions and brought to the scribe soon after the moment of death. The carefully chosen location and disposition of the text on the shroud points to expert practice and a possible collaboration between scriptural and funerary practitioners. The binding of the shrouded body required the material possession of an adequate quantity of strips/cords and again a limited number of persons, some of them with sufficient expertise of the appropriate ritual gestures (manipulation of the shrouded body, knotting, possibly accompanied by oral prayers or incantations).

The wrapping of the shrouded body into a silk quilt again required several individuals to manipulate both the body and the large quilt. Once the body was installed on a funerary bed, it was ready to be transported to the burial, in our case to church 4 located in the Citadel. Independently of the fact the deceased was closely related to the royal house and/or to state administration, there was no direct connection between the building identified as the royal palace and this church, which means that the body of the deceased must have been transported from his/her house to church 4 via the street. The exposure of the body to public sight may explain the need to visually restore the deceased's important status by the means of the lavish silk quilts. At the same time, it may also reveal the belief of this society that the organization of the afterlife was patterned on the hierarchized world of the living. We may envisage the presence of a spiritual leader—a priest, or even a bishop—presiding over the procession of the body to the church, or at least welcoming the procession into the church and leading the prayers at the burial. The capacity of the church building being limited, only the most privileged part of the city's elite may have attended such funerals, while the common inhabitants participated probably only in the procession in the street. In any case, while the private body of the dignitary was concealed in the mortuary shroud, its public body was fully visible, exposed on the funerary bed, dressed in bright textiles.

An exception to this scheme is Gapoiapa's coffin. The tight binding of its coffin lid argues in favour of a much longer procession than from his palace or home to the

church, within the streets of the citadel. Keeping in mind the tragical events which caused the Makurian capital to be transferred from Dongola to Gebel Adda, it is tempting to advocate for a later dating of the use of the crypt burials and identify Gapoiapa as the anonymous king defied by his nephew and killed in the battle of 1365. Following the Nubian rule of succession, his brother Apakyrē, also a son of a Royal Mother, succeeded him on the throne. While Dongola was still occupied by the rebel nephew and the Banu Ja'd, Apakyrē withdrew to Gebel Adda, possibly taking with him the body of his brother to protect it from profanation and bury it in a safe place. Such a scenario, although hypothetical, would explain the uncommon arrangement of Gapoiapa's burial, compared with the other inhumations in the church crypts. It is not impossible that, at the moment of inhumation, the coffin was itself covered by a luxurious piece of textile, signalling the importance of the deceased to the wider community attending the funeral. However, this supposition, as well as the royal identity of Gapoiapa, must remain speculative in the absence of further material evidence.

**Acknowledgments** My research on the Gebel Adda textiles started many years ago, with the project *Nubian Textiles* (POLONEZ grant 2015/19/P/HS3/02100—MSCA agreement 665778), during which I was able to document and photograph the textiles and excavation archives curated at the Royal Ontario Museum, Toronto. More recently, I had the great opportunity to examine and photograph the textiles kept in the Nubia Museum, Aswan, in the frame of the *Costumes of Authority* project, led by Karel Innemée (POLONEZ grant 2021/43/P/HS3/00764—MSCA agreement 945339). I would like to express my sincere gratitude to the Royal Ontario Museum team (Krzysztof Grzyski, Cheryl Copson, Chris Paulociuk, Nicola Woods) and the Nubia Museum team (Thana Hassan Mousa, Yaseer Abdelrady, Fatma Awad El-Sayed, Sherif Saad Abdelmenaim) for their kind assistance during the time spent working on their collections. Special thanks also to Gillian Vogelsang-Eastwood (Textile Research Centre, Leiden) for her support and for sharing her unpublished report. Finally, I would like to thank Elsa Yvanez—this workshop was an excellent occasion to resume many years of research. Our ongoing collaboration in the project *Fashioning Sudan* (ERC Starting Grant 101039416) gave me also the chance to investigate more the ethnographic literature, providing new perspectives in the investigation of the Gebel Adda burials.

**Funding Information** Parts of the present research and open access funded by the European Union (ERC Fashioning Sudan, 101039416). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Council. Neither the European Union nor the granting authority can be held responsible for them.

## References

- Adams, W. Y. (1999). *Kulubnarti III. The Cemeteries*. London. Egypt Exploration Society.  
 Baker, P. (1995). *Islamic textiles*. British Museum Press.  
 Cairo. (1969). Exhibition catalogue. *Islamic Art in Egypt 969–1517*. Semiramis Hotel Cairo. 4 April – 30 April 1969. Ministry of Culture U.A.R.  
 Cuq, J. (1986). *Islamisation de la Nubie chrétienne. VIIe–XIVe siècles*. CNRS.  
 Garcin, J. C. (1976). *Un Centre musulman de la Haute-Egypte médiévale, Qus*. IFAO.

- Godlewski, W., Mahler, R., & Czaja-Szewczak, B. (2012). Crypts 1 and 2 in the Northwest annex of the Monastery on *kom H* in Dongola: Report on the exploration in 2009. *Polish Archaeology in the Mediterranean*, 21, 338–360.
- Kennedy, J. G. (1978 [2005]). Nubian death ceremonies. In J. G. Kennedy (Ed.), *Nubian Ceremonial Life* (pp. 224–244). American University in Cairo Press and the University of California Press.
- Łajtar, A., & van der Vliet, J. (2017). *Empowering the dead in Christian Nubia: The texts from a medieval funerary complex in Dongola. Journal of Juristic Papyrology supplement 32*. University of Warsaw.
- Mackie, L. W. (1984). Toward an understanding of Mamluk silks: National and international considerations. *Muqarnas*, 2, 127–146.
- Mackie, L. W. (2015). *Symbols of power. Luxury textiles from Islamic Lands, 7th-21st century*. The Cleveland Museum of Art.
- Mahler, R., Godlewski, W., Danys-Lasek, K., & Czaja, B. (2015). Crypt 3 in the northwest annex of the monastery on *Kom H* in Dongola: Report on the exploration in 2012. *Polish Archaeology in the Mediterranean*, 24(1), 352–367.
- Millet, N. B. (1967). Gebel Adda preliminary report, 1965–66. *Journal of the American Research Center in Egypt*, 6, 53–63.
- Seignobos, R. (2016). *L’Égypte et la Nubie à l’époque médiévale. Elaboration et transmission des savoir historiographiques (641-ca. 1500)* (Unpublished PhD dissertation). Université Paris 1 Panthéon-Sorbonne.
- Seignobos, R. (2018). Back to the sources: Egyptian-Nubian relations under Baybars (1260-1277) according to the earliest Arabi accounts. In M. Honegger (Ed.), *Nubian Archaeology in the XXIst century. Proceedings of the Thirteenth international Conference for Nubian Studies, Neuchâtel, 1st-6th September 2016* (pp. 135–148). Peeters, Leuven, Paris, Bristol.
- van Gennep, A. (1909 [1981]). *Les rites de passage*. Editions Picard.
- van Gerven Oei, V., Łajtar, A., & Wozniak, M., (forthcoming). Four Old Nubian Burial Shrouds from Gebel Adda (submitted to *Journal of Egyptian Archaeology*).
- Vantini, G. (1975). *Oriental sources concerning Nubia*. Heidelberg Akademie der Wissenschaften/Polish Academy of Sciences.
- Wozniak, M. (2016). The chronology of the eastern chapels in Banganarti Upper Church – Some observations on the genesis of the “apse portraits” in Nubian royal iconography. In A. Łajtar, A. Obluski, & I. Zych (Eds.), *Aegyptus and Nubia Christiana. The Włodzimierz Godlewski Jubilee volume on the occasion of his 70th birthday* (pp. 629–646). Polish Centre of Mediterranean Archaeology, University of Warsaw.
- Yvanez, E., Murillo, M. L., Francigny, V., & de Voogt, A. (2020). Cultural interconnections: Textile craft and burial practices in early medieval Sudan. *Archaeological Textile Review*, 62, 32–44.

**Magdalena M. Wozniak** is an archaeologist, currently an Assistant Professor at the University of Warsaw and a Postdoctoral Researcher at the University of Copenhagen. Her research focuses on the textile production and dress practices in the Nile Valley (Sudan and Egypt). She is a member of the *EuroWeb* COST Action.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter’s Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter’s Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



## Chapter 9

# Conservation Approaches for Pyre-Burial Textiles Excavated in Greece



Christina Margariti, Stella Spantidaki, Maria Kinti, and Tina Chanielaki

**Abstract** Archaeological textiles are generally made of organic materials (like plant and animal fibres), which are largely affected by microorganisms growing in a burial/archaeological context. Special conditions that inhibit microbial growth need to be established for textile preservation to be achieved. In Greece, the most common condition is the gradual replacement of the organic matter of the textile fibres by metal salts, a process known as mineralization. Copper is the metal that, upon degradation, forms salts with the highest biocidal properties. Across the country, many textiles have spent thousands of years underground in the vicinity of copper artefacts. More specifically, in the case of pyre burials, the remaining cremated bones of the deceased would have been cleansed, wrapped in textiles, and placed inside copper-alloy urns to be buried. This burial custom, practised over a span of several centuries, has preserved some of the most important textile finds in Greece. This paper gives an overview of the types of textiles and fibre identification of pyre-burial textile finds and the conservation strategies followed for a selected set of case studies (dated from c. 1100–480 BCE). Linen fibres have been identified in the vast majority of textiles from pyre burials, which could be due to either the conditions established in the burial (favourable to cellulosic rather than proteinaceous fibres), or to burial customs. Of significant importance is the fact that at least three different

---

C. Margariti (✉)

Head of the Applied Research Department at Directorate of Conservation, Hellenic Ministry of Culture, Athens, Greece

S. Spantidaki

ARTEX, The Hellenic Centre for Research and Conservation of Archaeological Textiles in Athens, Athens, Greece

M. Kinti

Freelance Textile Conservator, Athens, Greece

T. Chanielaki

Hellenic Ministry of Culture, the Directorate of Conservation of Ancient and Modern Monuments (DCAMM), Athens, Greece

© The Author(s) 2025

E. Yvanez, M. M. Wozniak (eds.), *Funerary Textiles in Situ*, Interdisciplinary Contributions to Archaeology, [https://doi.org/10.1007/978-3-031-69461-5\\_9](https://doi.org/10.1007/978-3-031-69461-5_9)

205



textiles seem to have been placed inside the urns, while their construction and decoration includes techniques like tapestry, embroidery, and stitching, and dyes like shellfish purple and madder.

**Keywords** Textile conservation · Analysis · Interventive methods · Pyre burials

## 9.1 Introduction

The archaeological textiles discussed in this paper were funerary fabrics from pyre burials, used to wrap the remains of the incinerated bones of the deceased, along with fruit and/or other offerings, and placed inside copper-alloy vessels for burial. More than one textile was identified in each case study, and together these are considered quite exceptional finds, since textile preservation in burial contexts in southern Europe is very rare, due to the unfavourable prevailing environmental conditions. The temperate climate in this region excludes both very hot and extremely cold temperatures, and is characterized by great temperature and moisture level fluctuations between summer and winter. These conditions are deleterious to the preservation of organic materials, such as textile fibres, as they induce physical (i.e. shrinkage and swelling) and chemical (i.e. hydrolysis) degradation processes, and encourage microorganism growth that leads to enzymatic hydrolysis of cellulose and proteins (Szostak-Kotowa, 2004).

In fact, special conditions that prevent microbial growth need to be established in burials for textiles to be preserved. Conditions like extreme dryness (desiccation), constant moisture (waterlogging), or permafrost, gradual replacement of the organic matter by metal salts (mineralization) and incomplete burning (carbonization) are commonly responsible for textile preservation (e.g. Margariti, 2020; Gleba & Mannering, 2012: 2; Thompson & Jakes, 2005; Peacock, 1996; Rast-Eicher, 2003: 47; Wild, 1988: 7–13). In the cases discussed here, the textile finds had been preserved by mineralization as a result of having been buried inside copper-alloy vessels. Mineralization is the name given to the process of textile preservation achieved when organic fibres of a textile in close contact with a metal object are gradually replaced by the metal corrosion products. In addition, the metal ions act as microorganism inhibitors, protecting the fibres from attack by microorganisms. Copper ions form complexes or bonds with the end groups or hydroxyl groups in the cellulose, thus stabilizing it and protecting it from further degradation (Chen et al., 1996).

Conservation is the comprehensively documented action taken by adequately qualified professionals, to diagnose the condition of cultural property in order to retard or prevent deterioration or damage, and to retain its significance as primary evidence, by control of the environment, whether in store, display, or transport, and/or treatment of the structure, and/or research that conforms to established legal, ethical, and academic practices, in order to maintain it as nearly as possible in an unchanging state, accessible to present and future generations (ECCO, 2021; ICOM,

1984). The case studies discussed below show the different approaches selected to accommodate the needs of each find.

## 9.2 Case Study A: The Lefkandi Textile Find

This find came to light during a systematic excavation by the British School at Athens in collaboration with the Hellenic Archaeological Service in 1981, in the cremation of a man found inside a monumental building within the Toumba cemetery at Lefkandi, in Euboea, Greece, dated to 950 BCE (Popham et al., 1982). The cremated man was dubbed the Hero of Lefkandi, as he was buried with the status of a warrior with an iron sword, a spearhead, and a whetstone. The cremated bones of the male were inside a bronze cinerary urn covered with a bronze bowl. The urn, a Cypriot bronze amphora, contained the textiles and bands, preserved in remarkably good condition. According to the excavators, the decorated strips were readily evident upon removal of the covering, while the main cloth was recorded as having been placed rolled inside the amphora. The textiles were conserved soon after their excavation. According to the original reconstruction, the main textile is a 1.4 m long garment, with an opening for the neck but not for the arms; it was presumed that there was no possible association between this and the bands, and they were placed side by side. The aim of the recent study and conservation in this case was to revisit the find, and assess the past conservation and reconstruction. Instrumental analysis (namely, stereomicroscopy, 3D stereomicroscopy, Scanning Electron Microscopy (SEM), and High Performance Liquid Chromatography) revealed three different textiles and two woven bands all bearing remarkable types of decoration: a balanced tabby cellulosic fabric (S2z,<sup>1</sup> approximately 19 x 19/cm<sup>2</sup>) with symmetrical pile knot decoration that has been reconstructed into a three-dimensional shape; a second balanced tabby cellulosic fabric (S2z, approximately 15–22/cm<sup>2</sup>); a weft-faced tabby (z, 20 x 80/cm<sup>2</sup>) most probably made of cellulosic bast warps and wool wefts, decorated with murex purple dye; two woven bands with geometrical relief patterns, of 10 and 15 mm width respectively, the latter decorated with red dye from the Rubiaceae family. Also identified were loose fragments of decorative elements such as weft wrapping (Soumak technique) and tapestry, which were made of cellulosic bast fibres (Margariti & Spantidaki, 2020) (Figs. 9.1 and 9.2).

---

<sup>1</sup> In the ancient Aegean, fibres were often spun in a clockwise direction, producing a so-called z-spun thread. Two threads could then be plied together to produce a stronger and thicker yarn. This was usually done in the opposite direction to the individually twisted threads, in our case in a -s direction, resulting in the notation S2z.



**Fig. 9.1** Example of weft-wrapping loose decoration fragment from the Lefkandi find. Scale bar 1.8 mm. (Copyright ARTEX)

### 9.3 Case Study B: The Argos Textile Find

In April 2007, a rescue excavation conducted by the Hellenic Ministry of Culture — under the aegis of Dr. Alkistis Papadimitriou — brought to light part of a cemetery of the early Archaic period (seventh century BCE) in the city of Argos (north-east Peloponnese) (Margariti & Papadimitriou, 2014). Among the oversized ceramic funerary vessels (*pithoi*) recovered, there was a much smaller, though very significant, copper vessel of a unique capsule shape. The two compartments of the vessel were held in place by iron pins. The copper vessel was in such a very poor state of preservation that, despite all the precautions taken, part of its bottom collapsed while lifting it from the site, thus revealing a substantial number of textiles inside. The aim of the conservation of the textiles in this case was to salvage evidence on the textiles and burial customs that might otherwise have been lost. The application of non-destructive and, in this case, non-invasive methods of analysis (namely, stereomicroscopy, Scanning Electron Microscopy, X-ray fluorescence, and Fourier transform infrared microspectroscopy in reflectance mode (FTIR)) revealed that three different textiles had been placed in the urn: a coarse weft-faced tabby fabric ( $7 \times 27/\text{cm}^2$ ) made of cellulosic warps and most probably wool wefts was placed at the bottom; at least two pieces of a medium-weight balanced tabby fabric ( $16 \times 16/\text{cm}^2$ ) made of cellulosic bast fibres and stitched along the selvages (Fig. 9.3) were



**Fig. 9.2** Example of tapestry loose decoration fragment from the Lefkandi find. Scale bar 4.5 mm. (Copyright ARTEX)



**Fig. 9.3** Detail of stitching on one of the textiles present in the copper urn found at Argos, Greece. Scale bar 1 mm. (Copyright Ch. Margariti)



used to wrap the remaining bones of the deceased and fruit offerings, and placed on the coarser fabric; and, a third extremely fine open tabby fabric ( $16 \times 48/\text{cm}^2$ ), an almost transparent fabric made of cellulosic warps and probably proteinaceous wefts, was laid on top of the wrapped textile (Margariti & Papadimitriou, 2014).

## 9.4 Case Study C: The Eleusis Textile Find

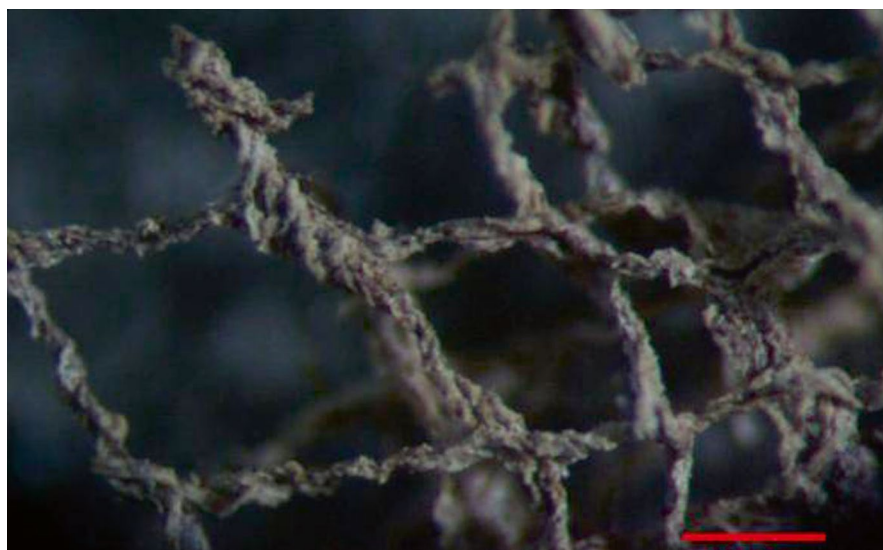
The Eleusis textiles were recovered in 1953 from a fifth-century BCE burial at the cemetery of Eleusis during a systematic excavation conducted by the Hellenic Archaeological Society. They were found wrapped around bones and ashes from a cremation burial. They had been placed inside a copper urn, that had in turn been placed in a stone sarcophagus along with five painted ceramic funerary vessels, known as *lekythoi*. The copper urn was in good condition, measuring 240 mm in height and approximately 1 m in circumference (Mylonas, 1953: 81). The main volume of the folded textiles had a rectangular shape (Mylonas, 1953: 81) and measured approximately  $100 \times 100 \times 50$  mm (Zissis, 1954: 587). This find has been on permanent display at the Archaeological Museum of Eleusis from the time it was conserved in 1954 until 2019, when it was taken down to be conserved again to go on display at the refurbished museum. The find that had been on display consists of two different but similarly constructed textiles stitched together along their width. Both are linen tabbies (z,  $18 \times 17/\text{cm}^2$ ), measuring  $2.20 \times 0.50$  m (Margariti & Chaniadaki, 2019) (Fig. 9.4). During conservation, a fragment from a third textile was found inside the copper urn, between the remaining incinerated bones of the deceased. This find is in agreement with the publication of the excavator, where he mentioned that the bones inside the urn were wrapped with a textile, while a folded textile bundle was resting on top of them, and the latter was taken to the museum to be unfolded and conserved (Mylonas, 1953: 85).



**Fig. 9.4** The unfolded Eleusis textiles as they were displayed in the past. (Copyright Hellenic Ministry of Culture)

## 9.5 Case Study D: The Kerameikos Textiles Find

This find was excavated in 1936 by the German Archaeological Institute at Athens during a systematic excavation at the Kerameikos cemetery in Athens. It was found in grave 35 HTR73 (Knigge, 1988: 108) from the Classical period, inside a copper *lebes*. The shape and decoration of the copper *lebes* and the stratigraphy of the grave indicated that the finds date to the last third of the fifth century BCE (approximately 430–400 BCE). In the late 1960s, the find was analysed (Hundt, 1969: 66) by microscopy and staining tests that revealed five different textiles present, made of silk of the cultivated *Bombyx mori* species. In later publications (Good, 2010: 36–40; Good, 1995: 966), it was reported that microscopic and amino acid analysis of the Kerameikos textiles confirmed the presence of wild silk, while in a more recent microscope study also the presence of wool (Spantidaki, 2016: 112). Since the find had been sampled many times in the past, the aim of its conservation was to assess its condition and attempt to shed light on the controversial issue of fibre identification. The application of instrumental analysis (as in case study B as well as Polymerase Chain Reaction) revealed indeed five textiles in total: two weft-faced tabbies of different weave counts (z,  $20 \times 60/\text{cm}^2$  and  $30 \times 100/\text{cm}^2$ ), the one with the higher weave count was decorated with purple wefts dyed with murex purple (Fig. 9.5); two balanced tabbies (z, approximately  $30 \times 30/\text{cm}^2$ ); and a very fine net (Fig. 9.6). The condition of the fibres was so poor that fibre identification was still inconclusive, but a very important finding of the analyses was that the find was



**Fig. 9.5** Detail of the purple wefts in one of the Kerameikos textiles. Scale bar 0.5 mm. (Copyright M. Kinti and Ch. Margariti)





**Fig. 9.6** Detail of the fine net present in the Kerameikos textiles. Scale bar 0.2 mm. (Copyright M. Kinti and Ch. Margariti)

suffering from biodeterioration. The fungus *Aspergillus terreus* was detected still active on the textiles. Therefore, they were treated by placing them in anoxic conditions at low temperatures (below 10 °C) for a prolonged period of time. This made the fungus inactive, and to remain that way it was important to store the find in the appropriate environmental conditions with relative humidity (RH) levels below 60 per cent (Margariti & Kinti, 2014).

## 9.6 Case Study E: The Odos Thevon Textile Find

The Odos Thevon textiles were excavated in 1983, during a rescue excavation due to road construction works near Piraeus. The excavation brought to light part of a fifth-century BCE cemetery. Among the finds recovered was a copper funerary vessel containing textiles. The main volume of the folded textiles measures approximately 240 × 160 × 40 mm. The copper vessel was in very good condition but was kept completely sealed, as noted in the excavation diary by the archaeologist in charge, Dr. Elena Papastavrou. The aim of the conservation was to retain as much information as possible as to how the textiles had been folded and placed inside the urn, as this would be of great importance in understanding the burial customs of the area and time period it came from. The application of non-destructive and non-invasive analysis (as in Case Study B as well as 3D and Computed Tomography

scanning), revealed that three different textiles had been folded together and placed inside the urn. These textiles were not used to cover the remaining bones of the deceased, as CT scanning did not reveal any bones inside the bundle. They are all balanced tabbies (z,  $15 \times 15/\text{cm}^2$ ; z,  $25 \times 25/\text{cm}^2$ ; z,  $22 \times 22/\text{cm}^2$ ) made of cellulosic bast fibres. In order to preserve the information on burial customs from this folded textile find, it was decided not to physically unfold it. A combination of 3D and CT scanning data will be used to digitally unfold the textiles. However, it can be seen that the textile with the higher weave count bears a repeated pattern of holes in a circular (floral?) pattern indicative of embroidery (or another type of needle decoration). A loose fragment of this textile was removed from the bundle and treated with humidification to relax its folds and creases. This treatment revealed an additional needle decoration pattern of geometrical shape and remains of the decoration thread (Margariti, 2018) (Figs. 9.7 and 9.8).



**Fig. 9.7** A loose fragment of one of the Odos Thevon textiles with evidence of embroidery during conservation. Scale bar 30 mm. (Copyright Ch. Margariti)



**Fig. 9.8** Detail of the decoration on one of the Odos Thevon textiles after conservation, showing the remains of the decorative thread preserved. (Copyright Ch. Margariti)

## 9.7 Discussion

As stated in the introduction, conservation covers a wide spectrum of actions, and decision-making when selecting the most appropriate one is mainly dictated by the needs of the artefact. In the case of excavated finds in general, and textiles in particular, retaining the constituent matter is equally important as retaining its significance as primary evidence, and that, in the case of textiles, is usually achieved by the application of instrumental analysis (Brooks et al., 1996). Fibre identification is the primary aspect of textile studies, since the use of a specific material holds information on cultural choices, technological advancements, possible trade routes, economy, and even palaeoenvironmental data. However, the burial conditions which excavated textiles have endured often have dramatic effects on features of the material, like the fibres' morphology, which play a key role in identification (Margariti, 2021). In addition, when working with mineralized textiles, the impregnation and replacement of the organic matter of the fibres by the metal degradation products makes fibre identification even more challenging (Margariti & Loukopoulou, 2016). Consideration of the above, as well as the fact that excavated textiles are rare finds, makes the selection and combination of non-destructive techniques (like SEM and FTIR) a prerequisite. However, non-destructive methods of analysis have limitations and, depending on the condition of the find, can lead to inconclusive results, as



in Case Study D (the Kerameikos textile find). The type of fibre used for the wefts in the two weft-faced tabbies has still not been determined, while the small quantity of the net that has been preserved does not allow for the application of even non-destructive techniques, which are still invasive (as some fibres would be “sacrificed” by the adhesive on the SEM sample stub). Part of conservation is to preserve the find in appropriate conditions that will prolong its life and therefore allow decisions on further analyses to be made in the future, when techniques will most probably have evolved to better accommodate its needs.

## 9.8 Conclusion

The case studies presented here show that large quantities of at least three different textiles were incorporated in the entombment of the remaining bones from pyre burials (Table 9.1). In all case studies, apart from case study D (the Kerameikos textile find, that in its present condition does not allow for such a statement to be made), there were textiles used to wrap the remaining bones and additional textiles placed in the urn, perhaps as a kind of offering to the deceased. In case studies A, B, and C, more than one piece of the same textile had been stitched together to make a much larger piece that would then be folded multiple times to fit the size of the urn. In case studies A and D, one of the textiles was dyed with murex purple, which was a costly and luxurious commodity. The incorporation of elaborate decorative elements in three case studies, such as pile knots, tapestry, and woven bands (case

**Table 9.1** The textiles presented in the case studies

Case Study	Date	Construction	Wrapping bones	Stitching	Dye	Other decoration
		Balanced tabby cellulosic fabric (S2z, approx. 19×19/cm <sup>2</sup> )	No?	Yes	No	Pile knots
A. The Lefkandi textiles	Ninth–Eleventh century BCE	Balanced tabby cellulosic fabric (S2z, approx. 15–22/cm <sup>2</sup> )	?	?	No	
		A weft-faced tabby (z, 20×80/cm <sup>2</sup> ) most probably made of cellulosic bast warps and wool wefts	Yes?	?	Murex purple	Tapestry, weft-wrapping (Soumak)
		Woven bands	No	No	Rubiaceae	Geometric relief pattern

(continued)

**Table 9.1** (continued)

Case Study	Date	Construction	Wrapping bones	Stitching	Dye	Other decoration
		weft-faced tabby fabric ( $7 \times 27/\text{cm}^2$ ) made of cellulosic warps and most probably wool wefts	No	No	No	No
B. The Argos textiles	Seventh century BCE	balanced tabby fabric ( $16 \times 16/\text{cm}^2$ ) made of cellulosic bast fibres	Yes	Yes	No	No
		open tabby fabric ( $16 \times 48/\text{cm}^2$ ), cellulosic warps? And proteinaceous wefts?	No	No	?	No
C. The Eleusis textiles	Fifth century BCE	Two linen tabbies (z, $18 \times 17/\text{cm}^2$ )	No	Yes	No	Alternating coarser wefts creating a striped effect
		Linen tabby (z, $18 \times 17/\text{cm}^2$ )	Yes	No?	No	No
		Weft faced tabby (z, $20 \times 60/\text{cm}^2$ )	?	?	No	No
		Weft faced tabby (z, $30 \times 100/\text{cm}^2$ )	?	?	Murex purple	No
D. The Kerameikos textiles	Fifth century BCE	Balanced tabby (z, $30 \times 30/\text{cm}^2$ approx.)	?	?	No	No
		Balanced tabby (z, $30 \times 30/\text{cm}^2$ approx.)	?	?	No	No
		Fine net	?	?	No	Net
		Balanced tabby (z, $15 \times 15/\text{cm}^2$ ) made of cellulosic bast fibres	?	No	No	No
E. The Iera Odos textiles	Fifth century BCE	Balanced tabby (z, $25 \times 25/\text{cm}^2$ ) made of cellulosic bast fibres	?	No	No	Needle decoration (embroidery)
		Balanced tabby (z, $22 \times 22/\text{cm}^2$ ) made of cellulosic bast fibres	?	No	No	No

study A), an extremely fine net (case study D), and embroidery (case study E), could be indicative of a necessity to express extravagance, wealth, and even status in burial customs. The scope of this paper was not to provide archaeological information on pyre burials in general, as the time span, the provenance, and the cultures from which the textiles presented here originated from are very wide and diverse. It is within the scope of this paper, however, to show that the meticulous study and conservation of textile finds can reveal interesting and important information on the technological advancements and customs of the societies that produced and consumed them, and to stress the point that, especially in the case of excavated textiles, any conservation action undertaken should aim to preserve both tangible and intangible evidence.

**Acknowledgements** Prof. Irene Lemos, University of Oxford, UK; **Conservators:** Elissavet Anamaterou, Katerina Efthimiou, Daphne Filiou, Dr. Polytimi Loukopoulou, Fotis Katevas, Dr. Georgianna Moraitou, Giannis Papadakos, Margarita Sofou; **Archaeologists:** Dr. Leonidas Bournias, Dr. Pari Kalamara, Dr. Vassiliki Orphanou, Dr. Kalliope Papaggeli, Dr. Elena Papastavrou; **Chemists:** Dr. Georgios Kouros, Dr. Stavros Protopapas; **Hellenic Ministry of Culture:** Dr. Margarita Gleba, at the time of the Lefkandi analysis PI of the European Research Council under the European Union's Seventh Framework Programme (FP/2007-2013-312603), and was carried out within the scope of the project *Production and Consumption: Textile Economy and Urbanisation in Mediterranean Europe 1000–500 BCE (PROCON)*; Dr. Ina Vanden Berghe and Dr. Mathieu Boudin, Royal Institute for Cultural Heritage (KIK-IRPA), Belgium; Dr. Christophe Moulherat, Quai Branly Museum, France; Elsa Desplanques, Sorbonne University, France; Dr. Dimitris Michailidis, Laboratory Coordinator, The Malcolm H. Wiener Laboratory for Archaeological Science, ASCS; Dr. Dimitris Papageorgiou, Chemical Engineer, TITAN S.A.; Dr. Yiannis Sarandeas, Radiologist “ATTIKON” General Hospital.

## References

- Brooks, M., Lister, A., Eastop, D., & Bennett, T. (1996). Artifact or information? Articulating the conflicts in conserving archaeological textiles. In A. Roy & A. Smith (Eds.), *Archaeological conservation and its consequences, IIC preprints* (pp. 16–21). Copenhagen Congress.
- Chen, H. L., Jakes, K. A., & Foreman, D. W. (1996). SEM, EDS and FTIR examination of archaeological mineralised plant fibres. *Textile Research Journal*, 66(4), 219–224.
- ECCO. (2021). *Professional guidelines* (online). European Confederation of Conservator-Restorers' Organisations. [https://www.wipo.int/export/sites/www/tk/en/databases/creative\\_heritage/docs/ecco\\_guidelines.pdf](https://www.wipo.int/export/sites/www/tk/en/databases/creative_heritage/docs/ecco_guidelines.pdf). Accessed 1 Oct 2021.
- Gleba M, Mannering U (2012) Textiles and textile production in Europe. From prehistory to 400 AD. Oxbow Books, .
- Good, I. (1995). On the question of silk in pre-Han Eurasia. *Antiquity*, 69(266), 959–968.
- Good, I. (2010). *When East met West. Interpretive problems in assessing Eurasian contact and exchange in antiquity*. Draft from a paper delivered at the Vth ICAANE congress, Madrid. Available online [https://www.academia.edu/171052/When\\_East\\_Met\\_West](https://www.academia.edu/171052/When_East_Met_West). Accessed 27 Mar 2022.
- Hundt, H. J. (1969). Über vorgeschichtliche Seidenfunde. *Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz*, 16, 59–71.



- ICOM. (1984). *Code of ethics Copenhagen 1984, the conservator-restorer: A definition of the profession*. International Council of Museums. Available online: [http://www.icom-cc.org/47/about/definition-of-profession-1984/#.YVbu\\_ppBxPY](http://www.icom-cc.org/47/about/definition-of-profession-1984/#.YVbu_ppBxPY). Accessed 1 Oct 2021.
- Knigge, U. (1988). *Der Kerameikos von Athen, Führung durch Ausgrabungen und Geschichte*. Krene-Verl.
- Margariti, C. (2018). A 5th c. BC textile find with evidence of embroidery from Attica, Greece. In M. S. Busana, M. Gleba, F. Meo, & A. R. Tricomi (Eds.), *Purpureae Vestes VI* (pp. 67–74). *Textiles and Dyes in the Mediterranean Economy and Society*, Libros Pórtico.
- Margariti, C. (2020). The effects of artificial incomplete burning on the morphology and dimensions of cellulosic and proteinaceous textiles and fibres. *Studies in Conservation*, 65(7), –398. <https://doi.org/10.1080/00393630.2019.1709307>
- Margariti, C. (2021). The effects of micro-organisms in simulated soil burial on cellulosic and proteinaceous textiles and the morphology of the fibres. *Studies in Conservation*, 66(5), –297. <https://doi.org/10.1080/00393630.2020.1812245>
- Margariti, C., & Chaniyalaki, T. (2019). Old and new approaches in the conservation of excavated textiles. In H. Sutcliffe (Ed.), *Preprints 12th biennial North American Textile Conservation Conference. North American Textile Conservation Conference* (pp. 180–198). Ottawa-Gatineau.
- Margariti, C., & Kinti, M. (2014). The conservation of a 5th c. BC excavated textile find from the Kerameikos cemetery at Athens. In M. Harlow & M.-L. Nosch (Eds.), *Greek and Roman textiles and dress: An interdisciplinary anthology* (pp. 130–149). Oxbow Books.
- Margariti, C., & Loukopoulou, P. (2016). Storage solutions for excavated textiles tending to their recalcitrant behaviour. *Journal of the Institute of Conservation*, 39(2), 145–157.
- Margariti, C., & Papadimitriou, A. (2014). Material identification and technological analysis of a 7th c. BC excavated textile from Argos, Greece. *Archaeological Textiles Review*, 56, 14–23.
- Margariti, C., & Spantidaki, S. (2020). Revisiting the hero of Lefkandi. In M. Bustamante-Álvarez, E. H. Sánchez López, & J. J. Ávila (Eds.), *Purpureae Vestes VII: Redefining ancient textile handcraft. Structures, tools and production processes* (pp. 401–412). University of Granada.
- Mylonas, G. E. (1953). *The excavation of the Eleusis cemetery* (pp. 77–87). *Proceedings of the Hellenic Archaeological Service Annual Session*, Hellenic Archaeological Society. (in Greek).
- Peacock, E. E. (1996). Biodegradation and characterization of water-degraded archaeological textiles created for conservation research. *International Biodeterioration and Biodegradation*, 38(1), 49–59.
- Popham, M., Touloupa, E., & Sackett, L. H. (1982). Hero of Lefkandi. *Antiquity*, 56, 169–174.
- Rast-Eicher, A. (2003). Determinazione delle fibre. In M. Bazzanella, A. Mayr, L. Moser, & A. Rast-Eicher (Eds.), *Textiles, intrecci e tessuti dalla preistoria europea* (pp. 55–60). Riva del Garda.
- Spantidaki, S. (2016). *Textile production in classical Athens*. Oxbow Books.
- Szostak-Kotowa, J. (2004). Biodeterioration of textiles. *International Biodeterioration and Biodegradation*, 54, 165–170.
- Thompson, A. J., & Jakes, K. A. (2005). Textile evidence for Ohio Hopewell burial practices. *Southeastern Archaeology*, 24(2), 137–141.
- Wild, J.-P. (1988). *Textiles in archaeology*. Shire Publications Ltd..
- Zissis, V. G. (1954). Cotton, linen, and hempen textiles from the Vth century BC. In *Proceedings of the Hellenic Archaeological Service Annual Session* (pp. 587–593). Hellenic Archaeological Society. (in Greek).

**Christina Margariti** is a textile conservator trained at the Textile Conservation Centre/University of Southampton. She was a Marie Skłodowska Curie Fellow at the University of Copenhagen (project FIBRANET, Horizon 2020). She has been employed by the Hellenic Ministry of Culture since 2005 and has taught textile conservation at the Technological Educational Institute (TEI) of Athens.

**Stella Spantidaki** is an archaeologist specialised in archaeological textiles, and since 2015 the Director of ARTEX, the Hellenic Centre for Research and Conservation of Archaeological Textiles in Athens. She is interested in the interdisciplinary research of all ancient sources, as well as experimental archaeology and the use of digital techniques in the service of cultural heritage.

**Maria Kinti** is a freelance textile conservator trained at the Centre for Textile Conservation/University of Glasgow. She has been employed by the Hellenic Ministry of Culture and the Victoria & Albert Museum in London.

**Tina Chanialaki** is a textile conservator trained at the Textile Conservation Centre/University of Southampton. She is currently employed by the Hellenic Ministry of Culture at the Directorate of Conservation of Ancient and Modern Monuments (DCAMM), and has taught textile conservation at TEI.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



## Chapter 10

# The Stronghold Has Become a Grave: Preliminary Analysis of Fabrics from Early Medieval Trzcianka, Janów Commune, Poland



Malgorzata Grupa and Tomasz Kozłowski

**Abstract** The material presented here is a preliminary study of charred textiles from an early Medieval stronghold, damaged by fire probably in the late tenth or the first half of the eleventh century. The stronghold became a grave by chance. Layered fabrics were found on a fragment of a teenager's long bone. As these were of different quality fabrics, it is assumed that he was originally dressed in at least three layers of clothing. Other woollen fabrics were also found in the burnt area, and had been affected by the high temperature as well. Consequently, the possibilities for preliminary analysis were quite limited. It did, however, show that at this site there was a definite predominance of fabrics in tabby and not, as demonstrated statistically at other sites, in 2/2 twill. It is usual in any scientific discipline to report atypical results that deviate from commonly accepted findings, so the authors of this article have decided to present the collection of fabrics found.

**Keywords** Wool fabrics · Early medieval · Stronghold · Trzcianka · Poland

## 10.1 Research History and Dating of the Stronghold

Trzcianka stronghold (Fig. 10.1), Janów commune, Podlaskie province (north-east of Białystok), is situated in a naturally defensible location, on a small hill with an altitude slightly over 173 m AMSL. From the east, it is surrounded by marshes adjoining an unnamed stream, running north–south, and from the west by the marshy valley of the Brzozówka River. The site's exploration started in 2006, and further campaigns were conducted in 2007, 2009, and 2014–2018 (Andrzejewska &

---

M. Grupa (✉) · T. Kozłowski

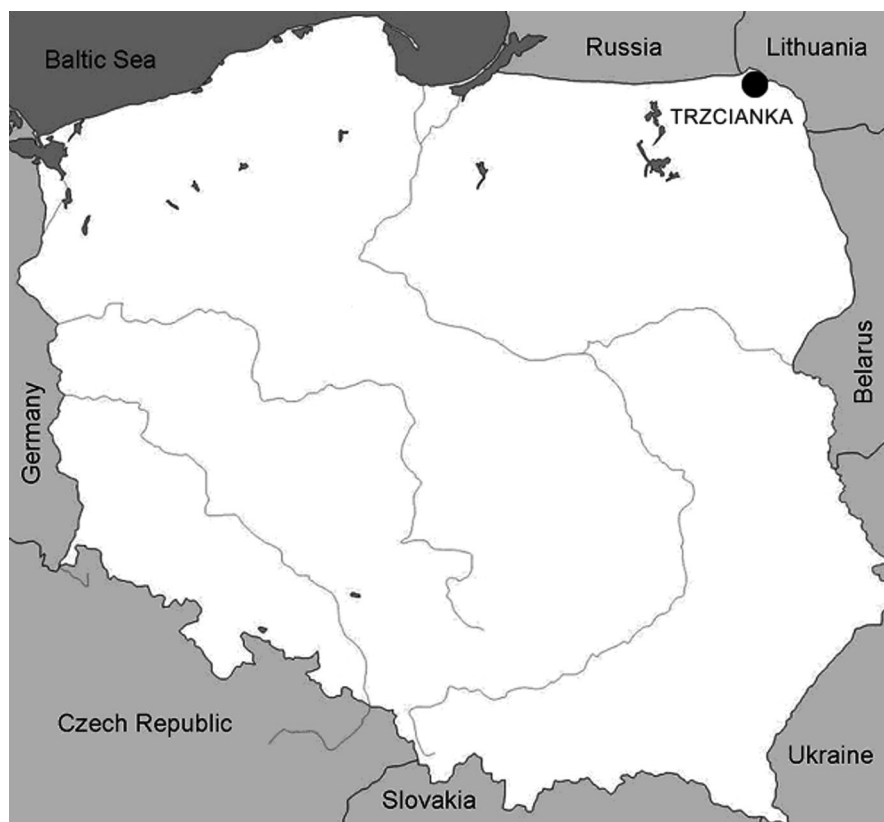
Institute of Archaeology, Nicolaus Copernicus University in Toruń, Toruń, Poland

e-mail: [mgrupa@umk.pl](mailto:mgrupa@umk.pl)

© The Author(s) 2025

E. Yvanez, M. M. Wozniak (eds.), *Funerary Textiles in Situ*, Interdisciplinary Contributions to Archaeology, [https://doi.org/10.1007/978-3-031-69461-5\\_10](https://doi.org/10.1007/978-3-031-69461-5_10)

221



**Fig. 10.1** Trzcianka's location on a map of Poland

Stankiewicz, 2009: 137–152; Stankiewicz, 2009: 97; Piasecka & Piasecki, 2016: 83–90; 2018, 2020: 169–174). Excavations concentrated on the defensive rampart, the stronghold yard, and the hill slope, adjacent to the west, the supposed location of a settlement. The fortified settlement, ca. 44 ares in size, was equipped with a defensive embankment constructed with stones, wood, and earth, for which the basic load-bearing element consisted of a double ring of stone walling, about 0.90 m high, constructed mainly with undressed stones mortared together. The stone wall was stabilized from both sides with gravel soil mixed with clay, which was also used for smoothening the walls' exterior. On the top of the structure—between the rings of walling—an oak wood palisade was erected, about 3 m high. Inside the ramparts, the archaeologists excavated remains of residential buildings adjoining the walls, and a single house with a pillar-based structure. Elements of the palisade and remains of buildings bore signs of a fire (Stankiewicz, 2009: 97). The archaeologists proposed that the stronghold garrison might have been attacked by an enemy, hence the signs of destruction spread in various forms all around the site.

Fieldwork revealed the existence of only one occupational layer, consisting of fragments of burnt wood, scraps of charcoal, ashes, and burnt rock pieces, as well as loose stones in general, mixed with sandy gravel soil of brownish-grey or brownish-black colour. The level was found immediately above the original gravel sediment. C14 analyses were carried out on four samples (two samples each from the palisade and lumps of charcoal) at the Poznań Radiocarbon Laboratory. These showed that the felling period of the wood was as follows: from the rampart—sample one = 660–870 CE, sample two = 680–880 CE; from burnt hearth material in the buildings—sample one = 670–870 CE, sample two = 650–770 CE. Wood from destroyed buildings may have been used for the hearths. We can therefore tentatively suggest that the fortress was built in the ninth century (Stankiewicz, 2009: 108–109).

Numerous weapon fragments were recovered, in particular iron arrowheads. A significant concentration of finds was discovered near the single standing building in the immediate vicinity of the walls. The direction in which the arrowheads were facing indicated that the attack must have been conducted from the north and north-west. Considering the site's size (about 44 ha) and the shooting range of simple bows (about 150 m), the arrowheads registered in this cultural layer should be interpreted as the remains of the attackers' weapons (Stankiewicz, 2009: 97–98). On the basis of their stratigraphic context, it must be inferred that all the arrowheads were fired at the same time, during a single massed attack, and therefore they were deposited at the same time. The co-occurrence of different arrowhead types, with the simultaneous absence of crossbow bolts, in conjunction with the chronology of other objects (Arab coins, ornaments, vessels) from the layer, enables us to date the time of the destruction of the castle to no earlier than the eleventh century.

## 10.2 Burnt Cultural Layer and Fabric

In 2018, the excavations revealed fragments of textile remains in the burnt layer, evidently distinct from the textiles found in the soil environment<sup>1</sup> (different look and consistency). The excavated textiles had features of unintentional carbonization: they had not been in direct contact with fire, but had been exposed to a very high temperature. This may have happened as the fire raged through the buildings; the collapse of a wooden-clay construction would have created a 'protective' layer for the textiles (Fig. 10.2). In such a situation, the textiles were probably covered by a layer of clay and wood, significantly reducing, if not completely excluding, access to air, thus preventing oxygen from reaching the textiles that would otherwise have consequently fuelled further combustion.

---

<sup>1</sup>Fragments known to the authors from Poland through previous studies (e.g. Jedwabno, Katyń, Charków)—mostly unpublished—were used for comparative analysis of the charred fabrics. For the first observations about carbonized textiles see Drażkowska & Grupa, 1996, 84–86.

**Fig. 10.2** Surface of charred fabric tabby (no. cat. 2B/18) with visible adventitious roots. (Photo D. Grupa)



Detailed examination of the material revealed an additional and extremely important fact for the reconstruction of their original context. Under the textile layers, there was the head of a human humerus, or—less probably—the head of a femur of an adolescent (age categories *infans* II or *juvenis*). This is demonstrated by the size of the preserved bone and the fact that it was not yet fused to the bone shaft. The head of the humerus bone usually fuses completely with the shaft between 18–23 years, and for the femur between 18 and 20 (White et al., 2012: 395).

The deceased, to which this bone belongs, must have been younger. Since the very fragile remains of carbonized textile had become tightly stuck onto the bone surface, the researchers did not wish to destroy the fabrics by removing them, which prevented univocal bone identification—humerus vs femur. It should be mentioned that the preserved bone head seems to be relatively ‘flat’, which may indicate an upper limb. It can, therefore, be cautiously accepted that the textile fragment could have come from part of the clothing situated directly around the humeral joint (shoulder). The visible bone surface is completely black, which indicates that the temperature must have been about 250 °C (Walker et al., 2008: 129–136).

A similar bone colour was reported for 28 per cent of the skeletons of Herculaneum inhabitants, who died as a result of the eruption of Vesuvius in 79 AD (Schmidt et al., 2015: 156), as well as on most of the bone surfaces affected by high temperatures in the case of the skeleton of a young woman excavated at Barczewko, in the remains of a building destroyed by fire (Kozłowski, 2019: 1–10). It can be presumed that the find from Trzcianka is also of a ‘catastrophic’ character. The intentional cremation of the dead body should definitely be excluded in this case, as the process



usually results in white and grey bones, due to the high temperature they are exposed to, and fragments of textiles are not preserved either.

It is impossible to establish at this stage of research how many people died in the fire. One thing is certain—a very young person, who probably did not manage to escape the flames and collapsing house structure, was one of its victims. The sub-adult individual might have been hurt beforehand, and their wounds prevented their rescue from the burning building in which they were trapped.

The bone head was surrounded by textile layers measuring  $6.5 \times 5.5$  cm, consisting of three kinds of fabric: one in tabby, another in 2/2 twill and the last also in tabby. All threads are Z-twisted. The densities are respectively  $10 \times 10$  threads/cm<sup>2</sup>,  $2.5 \times 5$  threads/cm<sup>2</sup> and  $8 \times 6$  threads/cm<sup>2</sup>, which fall into the ‘common textiles’ category as defined by Janina Kamińska and Adam Nahlik (1958: 80). The presence of three textile layers of various qualities is exceptionally interesting for our study, as it enables us to infer that the child was wearing three different pieces of clothing (underwear, dress-tunic and outerwear).

### 10.3 Conservation of Fabrics

All textile fragments (29 pieces) found in the burnt deposit were black, and their surface was delicately flaking away. Their surface was dirty with soil molecules and roots, precipitating damage and delamination. Therefore, before proceeding with further analyses, all fragments were properly conserved at the laboratory of the Institute of Archaeology of NCU (Nicolaus Copernicus University) in Toruń. Photographic documentation was made before the cleaning of the textile surfaces. Then, the textiles were dipped in an alcohol solution with 0.5 per cent PCMC (pentachlorometacresol) for disinfection. In the meantime, the artefacts were cleaned of soil impurities. The next step included consolidation with 15 per cent solution of Mowital B60 HHH (polyvinyl butyral resin) in toluene and alcohol in a 1:1 proportion. The impregnate was stabilized by applying a freeze-drying treatment (Grupa, 2012: 253–273).

Textile carbonization (incomplete burning) caused various changes to the fibres’ surface; hence, it is only our inference that these were woollen textiles, based on the fact that the textiles still retain substantial consistency, which is a feature of wool fabrics. Our laboratory experiments show that if these were fabrics made from plant material, e.g. flax or hemp, they would have had an ‘openwork’ structure. The carbonization process leads to the cell walls sticking together, creating free spaces between the weft and warp threads as the cells shrink in size under temperature due to the removal of water from the structure.

Similar conclusions were reached by Ch. Margariti (2020: 388–399), who studied the effect of carbonization<sup>2</sup> on the morphology and dimensions of selected fibres

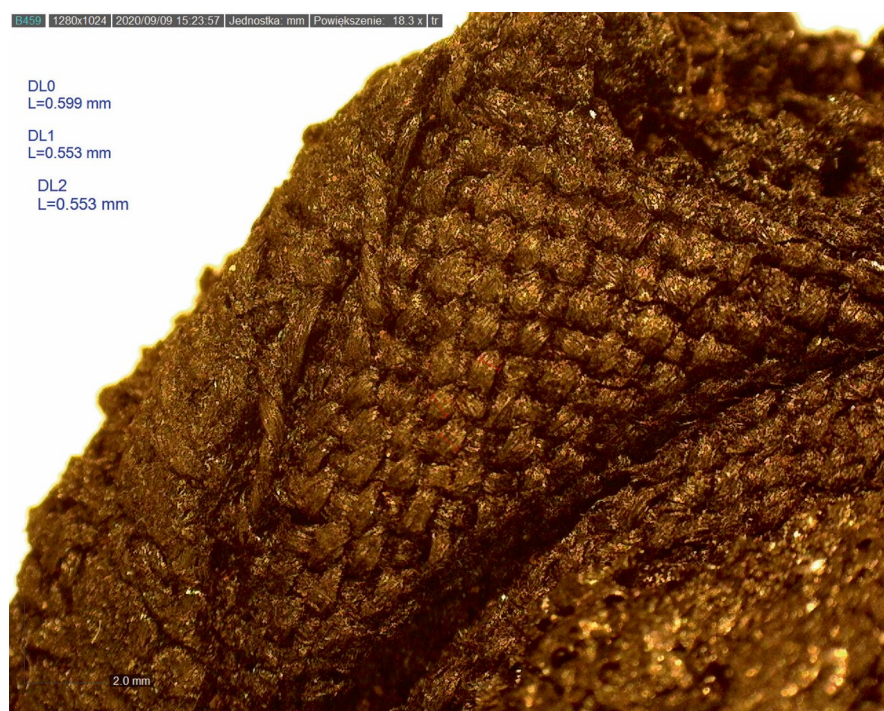
---

<sup>2</sup>Samples were carbonized in a limited oxygen environment at 250 °C, 350 °C, and 500 °C for one hour (apart from the wool samples, for which the duration of the experiment had to be lowered to six minutes).

used in textile production. All the cellulose and silk samples shrank and their weight decreased by varying degrees as the temperature increased. Wool fibres, on the other hand, swelled locally, but retained the scaly pattern on the surface.

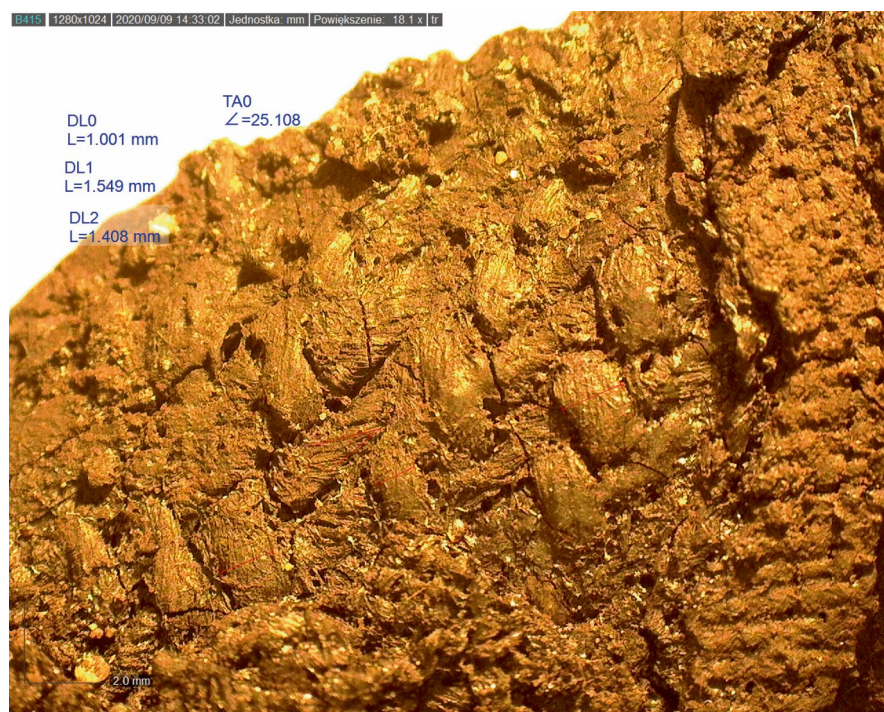
## 10.4 Fabric Analysis

Examining the textiles from Trzcianka, it should be stated that the process of significant delamination between the warp and weft threads was not observed, therefore we can infer that these were woollen textiles. In all the textile fragments, the threads are Z-spun. Their surface is piled a little, which is another characteristic pointing to wool. The collection mainly comprises tabby fabrics<sup>3</sup> (Figs. 10.2 and 10.3)—25



**Fig. 10.3** Visible layers of tabby fabric (no. cat. 2B.18); DinoLite® microscope magnification  $\times 18.3$ . (Photo A. Ulanowska)

<sup>3</sup> At the time of the study, 21 inventory numbers were distinguished. If there were, for example, five pieces of fabric of the same density recovered from one place, they were treated as one type of fabric in the final summary.



**Fig. 10.4** Fabric remains, different layers of fabrics and in the central part 2/2 diagonal twill weave and on the right side tabby, (no. cat. 4C/18): DinoLite® microscope magnification  $\times 18.1$ . (Photo A. Ulanowska)

items in total. There are also examples of 2/2 twill—three pieces (Figs. 10.4 and 10.5)—and one probably in 2/1 twill.

In this article, the author uses the textile classification framework suggested by Kamińska and Nahlik (1958: 80); textile density in warp and weft (sum): type IV—up to 18 threads; type III—from 19 to 27 threads; type II—from 28 to 37 threads; type I—from 38 threads and above.

It is interesting to note that there are only two tabby fabrics of type IV (with three different densities—8 per 6, 8 per 9, 8 per 10), 20 of type III (the analysis distinguished 10 types of density<sup>4</sup>), and again only two of type II (14/18 and 14/14 threads in warp and weft in 1 cm). Textile density usually depends on yarn thickness and the weaver's skill. In the case of these carbonized textiles, we have the impression that they had been carefully and precisely manufactured (it should be emphasized here again that this is just a visual estimate and only partly metrical). Three textile fragments in 2/2 twill belong to type IV. Their density is not high, only 5 per 5, 8 per 8

<sup>4</sup>These are the following thread layout configurations: 8 per 12 = 3 pieces; 9 per 11 = 1 piece; 9 per 14 = 2 pieces; 9 per 16 = 1 piece; 10 per 10 = 6 pieces; 10 per 12 = 2 pieces; 10 per 14 = 1 piece; 10 per 16 = 1 piece; 12 per 12 = 1 piece; 12 per 14 = 2 pieces.



B436 1280x1024 2020/09/09 14:57:34 Jednostka: mm Powiększenie: 15.8 x 1x



**Fig. 10.5** Fabric remains, different fabric layers and a 2/2 diagonal(?) twill weave, (no. cat. 5A/18): DinoLite® microscope magnification  $\times 15.8$ . (Photo A. Ulanowska)

and 6 per 5 threads in  $1\text{cm}^2$ , which is definitely lower than the tabby ones recovered from Trzcianka.

No appropriately sized archaeological fabric fragments have been found in Poland that can indicate the style of the clothing used in the 10th–11th centuries. At first glance, it would seem unlikely that such small fragments would allow additional conclusions to be drawn. However, the variable layering of the fabrics, with sometimes only two but up to 9–11 layers of the same fabric, indicates that we are most probably dealing with fragments of garments arranged in folds. This conclusion is confirmed by the few iconographic representations of, for example, figures from the Płock Evangeliary or the Gniezno Doors (Gutkowska-Rychlewska, 1968: 116; Bartkiewicz, 1979: 18; Grupa, 2022, 23–24). However, these are images of members of the royal courts, therefore we must be very cautious about their wider applicability. However, it seems reasonable to assume that life and work conditions determined the shape of certain types of clothes, which were tailored in a similar way, only in different qualities of textile.

Another composite was documented, where two or three layers of different textile types were superimposed on one another. These textiles were directly adhering to the young teenager's long bone head mentioned above, suggesting a series of clothing layers consisting of, e.g., a cloak, a tunic, and a shirt (the latter may have

been a linen shirt, although this could not be conclusively demonstrated). Alternatively, the clothing layers may have comprised a tunic and a woollen shirt or two tunics and a coat (with limited evidence, we have freedom to speculate in this case). There are other instances with a similar layering, although the textiles were not found in contact with human bone. However, the presence of various textiles superimposed one on another, likewise carbonized, leads us to surmise that they were derived from a similar clothing set to that described above.

## 10.5 Conclusions

In concluding our consideration of the textiles from Trzcianka, we realize that the picture we have obtained about this collection is not only incomplete, but even distorted. So far, early Medieval Polish textiles have come overwhelmingly from urban contexts (Kamińska & Nahlik, 1958: 181; Nahlik, 1965: 32; Maik, 1988: 126–129). Textiles from rural settlements, on the other hand, are thus far comparatively unknown. The stronghold at Trzcianka was probably a centre that belonged to the defensive system of the region. Yet, should it be treated as a village or the seat of a magnate? There is no basis for determining the number of inhabitants and the strength of the garrison at the time of the conflagration. At this stage of research, we only know that one of the youths failed to escape from the perimeter of the burning buildings. The fabrics were only obtained from the burnt wood layer. The number of textiles under consideration is not representative enough to change radically earlier opinions, but they do provide an interesting case study which should not be neglected in further studies on early Mediaeval textile manufacturing.

In summary, the dominance of the tabby at Trzcianka contradicts the statistics associated with previous estimates of the weaves used in the early Middle Ages. In publications concerning this period, the dominance of the 2/2 twill weave and its variations is indisputable (Kamińska & Nahlik, 1958, 181; Vons-Comis, 1982, 162; Crowfoot et al., 2001, 26–29; Maik, 1997, 31). From the eleventh century onwards, the production of textiles in 2/1 weave increases, and only in the fourteenth century is there a predominance of the simplified weaving method of tabby (Kjelberg, 1978, 83–104; Tidow, 1982, 115–122; Tidow, 1985, 271–293; Zimmerman, 2007, 99–112; Grupa, 2012, 52–54). So what has turned the generally accepted statistics upside down? It is known (also from experimental archaeology) that it is faster and therefore cheaper to make fabric in tabby weave. Even if we assume that these were local products, specific people living, for example, nearby, must have made them. Perhaps they were obliged to do so as part of the designated duties for a particular centre of power, in which case the exact quantity and quality was determined<sup>5</sup> (Grupa, 2012:

---

<sup>5</sup>Obligations of Slavic villagers towards the Fulda Monastery: “In Lipieniec [...] 28 Slavs give sheets [...], in Hagen [...] 120 Slavs each one pound of linen and one double blanket, [to this the named Slavs] give in the first year 8 blankets each, in the second year 10 blankets” (Nahlik, 1966: 77).

142–143). If this is taken into account, the surrounding population may have woven mostly tabby cloth, for the use of the inhabitants of the stronghold. Another possibility is that the fabric was made by people living in the castle. Women, even from noble families, wove on a daily basis. Nothing prevented local women, from both the upper and lower social strata, from weaving. Perhaps this is an example of the implementation of a decidedly cheaper production in certain centres, which were not fully aware of early Medieval manufacturing in other regions. There is no doubt that not all statistical generalizations should be considered applicable to every site studied. These considerations point quite clearly to the need for further archaeological research at least at Trzcianka, which will perhaps provide another group of textiles, and the opportunity to pursue further comparative analyses to verify these findings.

## References

- Andrzejewska, A., & Stankiewicz, U. (2009). Wczesnośredniowieczne grodzisko w Trzciance, gm. Janów, pow. Sokółka. *Podlaskie Zeszyty Archeologiczne*, 5, 137–152.
- Bartkiewicz, M. (1979). *Polski ubiór do 1864 roku*. Wrocław, Warszawa, Kraków, Gdańsk.
- Crowfoot, E., Pritchard, F., & Staniland, K. (2001). *Textiles and clothing c. 1150 – c. 1450*. Medieval finds from excavations in London: 4.
- Drażkowska, A., & Grupa, M. (1996). *Uwagi o konserwacji przedmiotów znalezionych w grobach oficerów polskich w Katyniu i Charkowie. Zbrodnia nie ukarana Katyń-Twer-Charków, Zeszyty Katyńskie nr 6*, wyd (pp. 78–90). Zarząd Główny Stowarzyszenia Rodzina Katyńska, Rada Ochrony Pamięci Walk i Męczeństwa.
- Grupa, M. (2012). *Wielkie tekstylia pospólstwa i plebsu gdańskiego (XIV–XVII w.) i ich konserwacja*. UMK Toruń.
- Grupa, M. (2022). *Czas żupanów, czas czechmanów. Strój polski w źródłach archeologicznych, ikonograficznych i pisanych*. UMK Toruń.
- Gutkowska-Rychlewska, M. (1968). *Historia ubiorów*. Wrocław, Warszawa, Kraków.
- Kamińska, J., & Nahlik, A. (1958). *Włókiennictwo gdańskie X–XIII w.* Łódź.
- Kjelberg, A. (1978). Tekstilmaterialet fra “Oslogate 7”. In Ø. Ervik (Ed.), *De Arkeologiske Utgravninger i Gamlebyen* (Vol. 2, pp. 83–104).
- Kozłowski, T. (2019). *Analiza antropologiczna szkieletu z Barczewka odkrytego w reliktach budynek nr 9*. Unpublished manuscript.
- Maik, J. (1988). *Wyroby włókiennicze na Pomorzu z okresu rzymskiego i ze średniowiecza*. Wrocław, Warszawa, Kraków, Gdańsk, Łódź.
- Maik, J. (1997). Sukiennictwo elbląskie w średniowieczu. *Acta Archaeologica Lodziensia*, 41, 7–125.
- Margariti, C. (2020). The effects of artificial incomplete burning on the morphology and dimensions of cellulosic and Proteinaceous textiles and Fibres. *Studies in Conservation*, 65(7), 398–399.
- Nahlik, A. (1965). *Tkaniny wsi wschodnioeuropejskiej X–XIII w.* Acta Archaeologica Lodziensia 13. Łódź.
- Nahlik, A. (1966). Rozwój włókiennictwa w okresie wczesnego feudalizmu (Włókiennictwo w okresie gospodarki naturalnej od VI do połowy XIII wieku). In J. Kamińska & I. Turnau (Eds.), *Zarys włókiennictwa na ziemiach polskich do końca XVIII wieku* (pp. 62–92). Wrocław, Warszawa, Kraków.



- Piasecka, K., & Piasecki, A. (2016). Sprawozdanie z weryfikacyjno-sondażowych badań wykopaliskowych przeprowadzonych w Trzciance, gm. Janów. *Podlaskie Zeszyty Archeologiczne*, 10–11(2014–2015), 83–90.
- Piasecka, K., & Piasecki, A. (2018). Sprawozdanie z badań planigraficznych przeprowadzonych w Trzciance, gm. Janów (stan. 1 i 14), Łosośnej Wielkiej, gm. Kuźnica (stan. 1) i Chmielniku, gm. Czarna Białostocka. Archiwum Działu Archeologii Muzeum Podlaskiego w Białymstoku, nr T/23.
- Piasecka, K., & Piasecki, A. (2020). Sprawozdanie z badań wykopaliskowych przeprowadzonych na stanowiskach 1 i 14 w Trzciance, gm. Janów w 2018 r. *Podlaskie Zeszyty Archeologiczne*, 14–15, 169–174.
- Schmidt, C. W., Oakley, E., D’Anastasio, R., Brower, R., Ashley Remy, A., & Viciano, J. (2015). Herculaneum. In C. W. Schmidt & S. A. Symes (Eds.), (pp. 149–161). Academic.
- Stankiewicz, U. (2009). Militaria z wczesnośredniowiecznego grodziska w Trzciance, pow. Sokółka. *Podlaskie Zeszyty Archeologiczne*, 5, 97–114.
- Tidow, K. (1982). Textilfunde aus dem Burghof und dem Heiligen-Geist-Hospital in Lübeck. *Lübecker Schriften zur Archäologie und Kulturgeschichte*, 6, 115–122.
- Tidow, K. (1985). Spätmittelalterliche Textilfunde aus Hameln, Bäckerstrasse 16. *Die Kunde NF*, 36, 123–129.
- Vons-Comis, S. Y. (1982). Medieval textile finds from The Netherlands. In L. Bender Jørgensen & K. Tidow (Eds.), *Archäologische Textilfunde* (pp. 151–162). Neumünster.
- Walker, P. L., Miller, K. W. P., & Richman, R. (2008). Time, temperature, and oxygen availability: An experimental study of the effects of environmental conditions on the color and organic content of cremated bone. In C. W. Schmidt & A. Steven (Eds.), *The analysis of burned human remains* (pp. 129–136). Elsevier.
- White, T. D., Black, M. T., & Folkens, P. A. (2012). *Human osteology*. Elsevier.
- Zimmerman, H. (2007). *Textiel in context, Een analyse van archeologische textielvondsten uit 16e-eeuws Groningen*. Groningen.

**Małgorzata Grupa** is a professor of archaeology with a specialisation in the conservation of archaeological artefacts at the Nicolaus Copernicus University in Toruń. In the Conservation Laboratory of the Institute of Archaeology at the Nicolaus Copernicus University, she conducts scientific, conservation and didactic activities. She has participated in numerous underwater and aboveground archaeological surveys in Poland and Europe. The material culture of the Middle Ages and modern times is invariably at the centre of her interests.

**Tomasz Kozłowski** works in the Department of Anthropology of the NCU in Toruń (Poland). His sphere of interests includes bioarchaeology and palaeopathology. He has participated in studies of early Medieval settlement complexes in Kałdus. He was a member of the research team studying the remains of the Neolithic settlement of Çatalhöyük in Turkey. He was also a member of the international scientific group studying the health conditions of European inhabitants from the end of the Palaeolithic until contemporary times (GHHP).

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



**Part IV**  
**Case Studies in Europe and the Nile**  
**Valley—Absent Textiles**

# Chapter 11

## Funerary Textiles in the Prehistoric Aegean: A Case of Two Mycenaean Textile Imprints from Tomb XXI at Deiras, Argos



Malgorzata Siennicka

**Abstract** Two small objects from the old excavations of J. Deshayes of the Mycenaean (Late Bronze Age) necropolis at Deiras at Argos (Tomb XXI), now in the archaeological storeroom of the French School at Athens in the Archaeological Museum at Argos, may have originally belonged to the same object or feature, broken during the excavation or later. The lumps of unfired clay or well-beaten earth bear imprints of textiles, which are otherwise only rarely preserved in funeral or habitation contexts in Bronze Age Greece. They are of special significance since they may represent negatives (impressions) of a bier cloth or blanket on which the deceased was laid, or of a shroud wrapped around a dead body. The aim of the paper is both to present the objects and the imprints of the textile(s), and to discuss the role of textiles in the funerary context of Mycenaean Greece.

**Keywords** Funerary textiles · Textile imprints · Aegean · Mycenaean · Bronze Age

---

The study of two textile imprints from Tomb XXI of the Mycenaean cemetery at Deiras in Argos took place on 13th June 2014 in the Archaeological Museum in Argos during my field trip to Greece as a Marie Skłodowska-Curie Fellow (Grant PIEF-GA-2012-329910) at the Centre for Textile Research in Copenhagen. A preliminary report of this study has been published in the *Bulletin de Correspondance Hellénique* (Siennicka, 2015–2016). A study of the finds from Argos-Deiras by A. Philippa-Touchais, G. Touchais, N. Papadimitriou, and other researchers, including the full publication of the textile imprints from Tomb XXI by the present author, will be published.

---

M. Siennicka (✉)  
University of Kassel, Kassel, Germany  
e-mail: [msr@uni-kassel.de](mailto:msr@uni-kassel.de)

## 11.1 Introduction

The paper discusses two small items made of unfired clay or well-beaten earth, which bear imprints of textiles. They were discovered by Jean Deshayes of the French School at Athens in Late Bronze Age chamber tomb XXI on the necropolis at Deiras in Argos in the Peloponnese (Greece). The artefacts are dated to the Late Helladic (LH) IIIA2 late–LH IIIB period (14th–13th centuries BCE).<sup>1</sup> They have been stored in the Argos Archaeological Museum, together with numerous other finds from Deshayes' excavations and those from the earlier work of Wilhelm Vollgraff, which have been studied for publication by Anna Philippa-Touchais, Gilles Touchais, Nikos Papadimitiou, and other researchers.

The importance of the objects presented here is due to the fact that items comparable to the textile imprints on unfired clay or earth are hardly ever preserved, recorded, or recognized in burial or habitation contexts from Bronze Age Greece. The imprints of textiles discovered in burial contexts may represent negatives (impressions) of bier cloths, blankets, or other pieces of textiles on which the deceased were laid, shrouds wrapped around the dead bodies, or pieces of cloth. As archaeological textiles are hardly ever preserved from prehistoric Greece, impressions of fabrics on clay or earth considerably add to our understanding of textile cultures in the Aegean. This paper aims to analyse the objects with textile imprints, present the archaeological context of the finds from Deiras, and discuss the role of textiles in the funerary context of Mycenaean Greece.

## 11.2 Chronology and the Cemetery of Deiras, Argos

The site of Argos, located near the coast of the Argolic Gulf, has been continuously inhabited since at least the Neolithic, during the entire Bronze Age, Antiquity, and Medieval period, up to modern times. It preserves numerous prehistoric architectural and funerary remains scattered around various areas of the ancient city, particularly on the hills of Larissa and Aspis, and on the foothills of Aspis (Papadimitriou et al., 2015). The Mycenaean necropolis is located in the ravine of Deiras between the hills of Aspis and Larissa. It consisted of around 40 chamber tombs and 30 pit and cist graves, and, accordingly, was one of the largest cemeteries in the Argolid. The tombs were grouped in four clusters: the south sector, excavated by Wilhelm Vollgraff (Vollgraff, 1904) seems to be the oldest part of the cemetery dating from LH IIA (1635/1600–1480/1470 BCE); the north sector and the central cluster, excavated by J. Deshayes, were used in the Late Mycenaean times (LH IIIA–LH IIIC; 1420/1410–1075/1050 BCE) (Deshayes, 1966); and the south-west cluster,

---

<sup>1</sup>The chronology of Mycenaean Greece after Manning, 2010 (tab. 2.2): Late Bronze Age (LBA) or Late Helladic (LH) period: LH I (1700/1675–1635/1600 BCE); LH IIA (1635/1600–1480/1470 BCE); LH IIB (1480/1470–1420/1410 BCE); LH IIIA1 (1420/1410–1390/1370 BCE); LH IIIA2 (1390/1370–1330/1315 BCE); LH IIIB (1330/1315–1200/1190 BCE); LH IIIC (1200/1190–1075/1050 BCE).

comprising two chamber tombs ('Larissa 1 and 2') and excavated in 1970 by E. Protonotariou-Deilaki, was used during LH IIA (1635/1600–1480/1470 BCE) and LH IIIB (1330/1315–1200/1190) (Papadimitriou et al., 2015: 174–176, Table 4; Papadimitriou et al., 2020: 60–65, Table 4.1, Fig. 4).

### 11.3 Tomb XXI

Tomb XXI (Fig. 11.1), which yielded two textile imprints on clay, was excavated by Jean Deshayes and the French School at Athens, and published in 1966. It was located in the central part of the Deiras necropolis (Deshayes, 1966: pl. I, pl. II. 1). The date of the tomb was estimated to be LH IIIA2–LH IIIB, i.e. the Late Mycenaean period (1420/1410–1200/1190 BCE) (Deshayes, 1966: 56–59, tab. on p. 253; Papadimitriou et al., 2020: Table 4.2). This collective tomb belongs among the largest examples, with its *dromos* 5.80 m long, 0.60–1.00 m wide, and up to 2.70 m high, and the chamber 2.90 × 1.70 m in size and up to 1.50 m high. (Deshayes, 1966: 56–57, pl. II. 1, pl. VIII. 1). At least four deceased were buried there along with numerous objects (Deshayes, 1966: 56–59, pl. LXI–LXII). A child, with their head directed towards the north, was probably the last individual buried in this tomb. Deshayes assumed that a Psi figurine with a *polos* (DM 30), dating to LH IIIB,<sup>2</sup> which was discovered behind the stone blocking wall of the *stomion*,



**Fig. 11.1** Tomb XXI in the central part of the Deiras necropolis in Argos. (After Deshayes, 1966: pl. II. 1)

<sup>2</sup>I would like to thank Dr. Melissa Vetter for her comment on the probable date of the figurine.

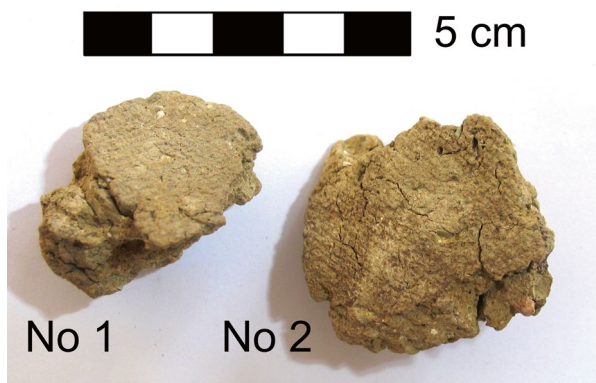


accompanied the last burial. A fragment of a bowl with panel decoration from the *dromos* has a suggested date of no earlier than the second half of LH IIIB (c. 1250 BCE) and gives a *terminus post quem* for the last burial (Deshayes, 1966: 58–59, 199, pl. LXII, 5). Deshayes associated imprints of textiles with this last interment. The body of the child is said to have laid on a thin layer of whitish clay with a thin rim, on which imprints of a linen fabric were still visible (Deshayes, 1966: 58).

## 11.4 Imprints of Textiles from Tomb XXI at Deiras

In the storeroom of the Argos excavations in the Archaeological Museum in Argos, there are only two little lumps of unfired clay or well-beaten earth that have been preserved from the original find of a thin layer or floor of whitish clay discovered in Tomb XXI. None of them bore an inventory number nor had an attached excavation label describing the find spot or layer. Likely, these two fragments were only part of a larger feature belonging to a fragile whitish (as described by the excavator) clay layer, which had probably been broken already during excavation. Because there are no clear joins between the two pieces, they may be just two random samples with well-preserved textile impressions, selected by the excavators from the larger clay layer or floor observed below the skeleton.

Both fragments are of unfired clay or well-beaten earth of beige-yellowish colour and contain mineral inclusions, such as tiny stones. The upper surfaces with the textile imprints are flattish, while their sides and undersides are broken, and therefore uneven and coarse. Cracks caused by the drying of the clay are visible all over the fragments (Fig. 11.2). The samples measure c. 3 × 3 cm (No. 1, Fig. 11.3) and 3.5 × 4 cm (No. 2, Fig. 11.4), and both are c. 2.5 cm thick.



**Fig. 11.2** Objects No. 1 and No. 2 with imprints of textiles from Tomb XXI at Deiras, Argos. (Photo M. Siennicka)

**Fig. 11.3** Object No. 1  
with a textile imprint from  
Tomb XXI at Deiras,  
Argos. (Photo  
M. Siennicka)



**Fig. 11.4** Object No. 2  
with a textile imprint from  
Tomb XXI at Deiras,  
Argos. (Photo  
M. Siennicka)



## 11.5 Methodology and Analysis

The objects were first examined macroscopically, with the naked eye and with a magnifying glass with five times magnification. A microscopic analysis was undertaken with a Dino-Lite digital microscope (AM4113TL, AnMo Electronics

Corporation) with 20 times magnification. The digital photographs and measurements were processed with the software program DinoCapture 2.0.

The textile imprints are relatively well preserved and visible with the naked eye. A textile or textiles must have been pressed against the wet or still moist clay or earth, most probably during the burial at the time when the earth floor was freshly prepared for a new interment. The imprints of the textiles are not very deep, but clear enough to enable an analysis of the structure and the type of weaves. They are also a little irregular, which implies that the textiles were pressed against the clay in a somewhat uneven manner, probably because they were stretched, and therefore their primary structures have slightly changed. The impression on No. 2 is slightly clearer, which may suggest that this piece of textile was less worn, the surface of the clay was moister than in the case of No. 1, or the pressure of the body was greater at this spot.

### ***11.5.1 Weave, Thread Count, and Structure of Fibres***

Textiles woven in plain weave (also called tabby) could be identified on both objects. Starting borders or selvages are not visible, therefore it is impossible to say which of the impressed threads belonged to the warp and which to the weft system.<sup>3</sup> Because there are similar numbers of threads in the warp and weft, which is ca. 9–10 × 10 threads per cm in each case, we may speak of a balanced tabby, one of the basic types of weaves in prehistory (Carington Smith, 1977: 114–115; Emery, 1980: 76–78; Barber, 1991: 126–128; Andersson Strand, 2015a: 49–50, Fig. 2.15; Grömer, 2016: 127–130).

The measurements of the thread impressions have demonstrated that in both systems, warp and weft, the yarns must have been very fine, as their impressions measured ca. 0.2 mm, and only in some cases nearly 0.4 mm, indicating a mean diameter of 0.3 mm. We should bear in mind that the diameters of the original threads could have been slightly greater because of the probable shrinkage of the clay or clayey soil during the drying process (Grömer & Kern, 2010: 3140). On the other hand, the diameters of the threads of a textile might have been expanded if it had been powerfully pressed against the floor by the weight of the body. The structure (single, spliced, spun, plied, etc.), twist, and angle of the threads could not be determined from the imprints. Textile(s) with a composition of 9–10 × 10 threads per cm and woven with yarns ca. 0.3 mm thick can be described as fine and open. While the majority of the thread impressions are equally thin (Figs. 11.3 and 11.4), one thread visible on object No. 1 is noticeably thicker than the others (Fig. 11.5, indicated by the green arrow). Possibly a double thread, either untwisted or plied, or a yarn of

---

<sup>3</sup>For a possible starting border of a textile visible on an EBA clay sealing from Geraki in Laconia, see Vogelsang-Eastwood, 1999: 372, Fig. 20a–b.



**Fig. 11.5** Object No. 1 from Tomb XXI at Deiras, Argos: digital microscope, magnification  $\times 20$ . The green arrow indicates a thicker yarn in the imprinted textile. (Photo M. Siennicka)

greater diameter, perhaps made of a different material, was applied for practical or decorative reasons.<sup>4</sup>

### 11.5.2 *Raw Materials of Unpreserved Textiles*

The question regarding the identification of the raw material(s) of the textiles remains open, as the examination of the imprints in the museum storeroom with a portable digital microscope did not allow a secure identification of the fibres. Nevertheless, the most probable fibres in the Bronze Age Aegean include flax and wool (Barber, 1991: 9–30; Tzachili, 1997: 27–68; Spantidaki & Margariti, 2017; Siennicka, 2023). Furthermore, other materials, such as goat hair and nettle (Moulhérat & Spantidaki, 2009a; Spantidaki & Moulhérat, 2012: 189, Fig. 7.3), hemp (Spantidaki, 2016: 22), sea-silk (Burke, 2012), or even wild silk

<sup>4</sup> Compare with a supplementary thread of nettle fibre in a band made of linen and goat hair from Late Bronze Age Chania on Crete, or a supplementary thread inserted into a textile from Geometric Lefkandi (Spantidaki & Moulhérat, 2012: 189, 194, Fig. 7.3, Figs. 7.7 and 7.8).

(Panagiotakopulu et al., 1997; Van Damme, 2012), and tree bark (Rast-Eicher, 2005; Banck-Burgess, 2020a, b; Reichert, 2020; Rast-Eicher et al., 2021) should not be excluded as possible fibre sources in Bronze Age Greece.

## 11.6 Raw Material and Structure of Textiles Preserved from the Bronze Age Aegean

Prehistoric organic materials, such as textiles, cordage, furs, skins, wooden and bast products, mats, and basketry only seldom survive to the present day because of unfavourable preservation conditions (Gleba & Mannering, 2012: 2–3; Grömer, 2016: 20–33; Siennicka, 2023). Textiles, which are only exceptionally discovered in Greece, and then mainly in funerary contexts (Spantidaki & Margariti, 2017: 49–50), are usually poorly preserved, damaged, fragmented, carbonized, mineralized, or preserved by metal corrosion (Burke & Chapin, 2016: 18–20; Spantidaki & Moulhéat, 2012; Margariti et al., 2014; Skals et al., 2015, with Appendix A and B; Moulhéat & Spantidaki, 2016; Spantidaki & Margariti, 2017: 51; Gleba, 2018). Several Mycenaean fabrics have recently been analysed, and provide us with important information regarding the yarn and weave structures, and raw materials. They originated from burial contexts, for instance, from Mycenae (Spantidaki & Moulhéat, 2012: 192–194, Figs. 7.4–7.6, Table 7.1), Pylona on Rhodes (de Wild, 2001: 14–15, pl. 34 a–d, pl. 51 a–d, colour plate 2 a–b; Spantidaki & Moulhéat, 2012: 192), and Ag. Kyriaki on Salamis (Moulhéat & Spantidaki, 2009b: 16, Figs. 1–4, 6–7, diagram 1–2; Spantidaki & Moulhéat, 2012: 192–194). One of the textiles was used to wrap three different bronze objects (two bronze daggers and a spearhead) in Tomb N of Circle B at Mycenae. Other textiles were used to close the mouths of ceramic vases, and were wrapped around the necks and handles (calcified textiles at Pylona on Rhodes). Finally, a mineralized piece of cloth was associated with jewellery, comprising three beads and an iron plaque, in Tomb 7 at Ag. Kyriaki on Salamis. Even if they clearly had different original purposes than the textiles imprinted on clay from Tomb XXI at Deiras in Argos, they still constitute good analogies regarding structures and weaves. All of them represent balanced tabbies made in linen, most likely spliced (Gleba, 2018: 15–16), with an average thread count of 15–20 threads per cm, woven with S2z-plied yarn<sup>5</sup> of ca. 0.3–0.5 mm (up to 0.9 mm) thickness (Spantidaki & Moulhéat, 2012: 192–194, Figs. 7.4–7.6, Table 7.1). Other textiles that were discovered in burial contexts, but apparently have never been properly documented and examined, belong mainly to older finds,

---

<sup>5</sup>Fibres can be spun in a clockwise direction (producing a so-called z-spun thread) or in an anti-clockwise direction (s-spun thread). The threads plied together produce a stronger and thicker yarn, which is usually plied in the opposite direction to the individually twisted threads. For example, when two individual z-spun threads are plied together, the plied yarn will be referred to as S2z, which was often the case in the prehistoric Aegean (Spantidaki & Moulhéat, 2012: 192–194, Figs. 7.4–7.6, tab. 7.1).

e.g., a fine and open textile preserved in several fragments, attached to a silver vessel from the Early Mycenaean Grave A of Grave Circle B at Mycenae (Mylonas, 1973: 22, pl. 22β), textiles attached to the bronze swords from the Early Mycenaean shaft graves of Grave Circle A at Mycenae (Schliemann, 1878, 326), and a large piece of textile found inside the bowl of a bronze lamp from Mycenaean chamber tomb 2 at Dendra (Persson, 1931: 77, 94, pl. XXXII, 4, on the right).

Thin threads like the ones from Deiras and from other Mycenaean sites were probably produced by splicing and plying (if vegetal fibres), or spinning (animal or vegetal fibres) with rather light and small (i.e. of small diameter) spindle whorls, as suggested by research on the relationship between the weight of a spindle whorl and the thickness of the produced thread (Grömer, 2016: 86–91, Figs. 41–42; Andersson Strand, 2015b: 139–142). An overview of frequently discovered textile tools in both habitation and burial contexts in Mycenaean Greece (Carington Smith, 1975: 419–446; Carington Smith, 1992: 675–686, Tables 11.1 and 11.2, Fig. 11.1; Fig. 11.2; Rahmstorf, 2008: 18–37, 126–138, Fig. 6, Fig. 34, pl. 1–5, pl. 47–51; Rahmstorf et al., 2015; and various papers on Late Bronze Age Greek textile tools in Andersson Strand & Nosch, 2015) proves that spindle whorls, which were made of clay, bone, and stone (e.g. steatite *conuli*), would have been appropriate to produce the fine threads from Argos. Open balanced tabbies could have been produced with light, but rather thick loom weights.<sup>6</sup> It is also worth mentioning that from the information on textile industries recorded in the Linear B texts (Killen, 2007; Nosch, 2012) it is clear that yarns and textiles of various quality were produced on a large scale in Mycenaean Greece.

## 11.7 Imprints of Textiles on Clay in the Prehistoric Aegean

Because archaeological textiles are hardly ever preserved in contexts from prehistoric Greece (see below), imprints of fabrics, basketry, and mats, which are preserved mainly on the walls and bottoms of vessels (e.g. Neolithic Kephala on Keos: Carington Smith, 1977: 114–115) and on the undersides of clay sealings (e.g. Early Bronze Age Geraki in Laconia: Vogelsang-Eastwood, 1999) provide indirect evidence of the decomposed organic materials (Siennicka, 2023). Macro- and microscopic analyses can, to a certain extent, provide data on technical features of fibres, threads, and textiles, their structure, and manufacturing technologies (Crowfoot,

<sup>6</sup>On the relationship between the weight and thickness of loom weights and the quality of the produced textile, see Mårtensson et al., 2009: 373–398; Andersson Strand, 2015b: 142–143; Grömer, 2016: 112–117, Figs. 61–62. It should be mentioned at this point that loom weights are not commonly discovered at Mycenaean sites, and the range of attested types on mainland Greece is rather limited. The most common (until LH IIIB), but still not very frequent, were the discoid loom weights of Minoan type, usually with one to two perforations in the upper zone. These loom weights would produce rather fine and dense fabrics. The question of the tools likely used to produce the textiles from Tomb XXI at Deiras, Argos remains open.



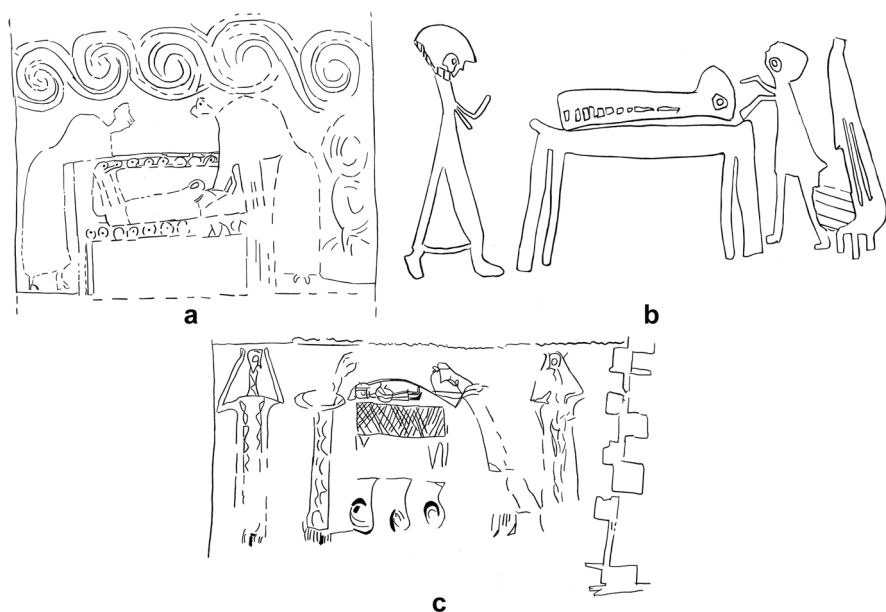
1954; Grömer & Kern, 2010). Moreover, the imprints indirectly offer insights into the specific uses of textile products, which were utilized in daily life, e.g. for clothes, furnishings, and also for the manufacture and decoration of pottery, technical, and recycling purposes (Grömer, 2016: 294–318), as well as in administrative practices when impressions of textiles, leather, cordage, basketry, and wickerwork are sometimes preserved on the reverse sides of clay sealings that were used to secure doors, storage jars, and baskets (e.g. Müller & Pini, 1997; Müller, 2004; Andersson Strand et al., 2017; Ulanowska, 2020). The impressions of textiles frequently show plain weave (tabby), usually open and balanced. This suggests that the fabrics that were typically used for pottery production or indirectly in administrative practice included rather simple textile products, like sacks, and linen napkins, or secondarily used, worn-out pieces of cloth (Breniquet, 2013: 3).

## 11.8 Imprints and Remains of Textiles in Funerary Contexts in the Prehistoric Aegean

The two fragments of clay with imprints of textiles from a burial context at Deiras in Argos add to a still modest corpus of Bronze Age Aegean textile imprints (Siennicka, 2023). They are of particular significance since they may represent negatives of bier cloths, or sheets, on which the deceased was laid, or they were impressions of a shroud that wrapped the body. We may assume that such textile items were frequently used, but they are extremely rarely preserved in archaeological contexts from prehistoric Greece. Among several known examples there are cloth imprints, perhaps from bedding, possibly related to a child skeleton, or belonging to a sack or another textile in which the remains of a second child were collected together in an Early/Middle Helladic pit grave at Malthi in Messenia. Unfortunately, no detailed description of the imprints nor an illustration were provided in the final publication (Valmin, 1938: 201, Fig. 34, pl. XIV.1). Furthermore, a thin layer of blue- and red-coloured substance, perhaps the remains of a cloth or blanket, were noticed in Tomb 11 at Routsis in Messenia (Marinatos, 1967: A16). Remnants of charred organic substances, wood, purple leather, and textiles were reported from three cist graves inside a tholos tomb at Kazarma in the Argolid; however, no additional information on the original leather and textile products were given (Protonotariou-Deīlaki, 1969: 4, 6). A fascinating example of a large piece of textile, or rather a succession of textiles and mats, c. 4.90 × 2.90 m in size, apparently covering the grave structure of a grave mound at Early Bronze Age Popeni in Romania (Bolohan & Lazanu, 2018) demonstrates that very large textiles and mats were also used in prehistoric graves. Under certain circumstances and geological conditions, and through very careful observations during excavation, more remains of decayed textiles and their imprints on earth or clay are presumably waiting to be discovered.

Covering the bodies of the deceased must have been a common practice in many cultures (e.g. Late Bronze Age Israel: van den Brink et al., 2017: 116–120; Fernández-Götz & Grömer, 2021: 338–339, Fig. 22.10), including the prehistoric Aegean (Cavanagh & Mee, 1998, 33, 109; Benzi, 1999; Lewartowski, 2000: 56; Phialon & Farrugio, 2005: 241–242). Accordingly, the imprints of textiles in burial contexts could also be related to funerary sheets or shrouds wrapped around the corpses. These kinds of textile items can be recognized in the painted imagery on clay coffins (*larnakes*), e.g. shrouds are likely shown on *larnax* no. 3 from Dendron (Spyropoulos, 1972: 34–35, pl. 48 a; Phialon & Farrugio, 2005: 241–242, Fig. 2), no. 22 from Gefyra (Spyropoulos, 1970: 190, Fig. 15; Spyropoulos, 1971: 14, pl. 14a; Benzi, 1999: 217–219, Fig. 2A; Phialon & Farrugio, 2005: 241–242, Fig. 8a), and from Pygi Rethimnou on Crete (Baxevani, 1995: 18, Fig. 10; Phialon & Farrugio, 2005: 241–242, Fig. 9). While the details of the scenes cannot be easily understood from the stylized and partially damaged paintings, they likely show dead persons, in two cases possibly children or young people, being laid on beds and inside coffins, and accompanied by two or more individuals, probably females. They seem to touch the deceased; perhaps they close their eyes and mouth, or ‘feed’ them. On *larnax* No. 3 from Dendron, they cover the body with a piece of textile, probably a shroud. On the other paintings, the dead persons seem to be wrapped with sheets or dressed in such a way that even their feet are invisible, while the head can be easily recognized (Fig. 11.6a, c). Covering the dead person might have belonged to a specific stage of the funeral ceremony, as suggested by the scene of *prothesis* on *larnax* 3 from Dendron, where a piece of textile, shown as a bent line held by two individuals, is being laid on the dead body of a child (Benzi, 1999: 217–219, Fig. 2 A–C) (Fig. 11.6b). Moreover, commonly found pieces of jewellery, e.g. small plaques and appliquéés, made of gold, faience, ivory, bone, and glass, were apparently sewn onto the (unpreserved) clothes and shrouds, or even glued on them (Cavanagh & Mee, 1998, 109).

Interestingly, the use of shrouds has indirectly been indicated in some burials, due to the position of certain bones (clavicles) (Phialon & Farrugio, 2005: 240–242, Fig. 6). In Late Minoan IIIA2 *larnax* II at Pankalochori on Crete, a pregnant woman was deposited on her side, with her knees bent and possibly a shroud wrapped around her body, held by nine bone needles. The grave goods included a bronze mirror with genii carved on its ivory handle, some small vases, a wooden *pyxis* with ivory inlays, a cylinder seal, necklaces, and gold rosettes (Baxevani-Kouzionis & Markoulaki, 1996). Presumably, analyses of bone positions and very careful examination of the soil in the immediate vicinity of the bones, especially on tomb floors, could bring to light further direct and indirect evidence for the use of textiles in burial contexts, including imprints on clay or earth.



**Fig. 11.6** Funerary scenes on *larnakes* from the Aegean, showing the deceased covered with shrouds: (a) *larnax* no. 22 from Gefyra; (b) *larnax* no. 3 from Dendron; (c) *larnax* from Pygi Rethymnou. (After Benzi, 1999, Fig. 2 A–C)

## 11.9 Conclusions

Both archaeological textiles and their imprints on clay or earth represent exceptional discoveries in the prehistoric Aegean, therefore every new find enriches the very modest collection of known examples. The items from Mycenaean Tomb XXI at Deiras in Argos are a welcome addition to this assemblage. They can likely be associated with the last child burial in the chamber tomb. The thickness of the threads and the type of weave (open balanced plain weave) suggest that they were rather simple, but fine fabrics, perhaps a sort of common ‘bedsheet’, which were previously used in daily life, or they belonged to shrouds made especially for funerary use. The remains of archaeological textiles and leather in graves, and imprints of fabrics, combined with the evidence from pictorial depictions of dead bodies covered or wrapped with textiles, and personal items, like jewellery, pins, fibulae, golden and ivory appliquéés, originally attached to the clothes of the deceased or to funerary textiles, demonstrate that textiles were used in different ways and played an important role in funerary rites and ceremonies. Consequently, we may expect that even more discoveries of archaeological textiles or their imprints could be made in graves if we pay even more attention to such ‘invisible’ finds, otherwise easily missed during archaeological research.

**Acknowledgments** I would like to thank Dr. Anna Philippa-Touchais and Dr. Gilles Touchais from the Argos publication team and the École française d'Athènes for their kind invitation to examine and publish the objects under discussion, and for additional information regarding the old excavations at Deiras, Argos. I would like to express my gratitude to the Ephorate Δ' ΕΠΚΑ for their swiftly granted permission to undertake this study. Prof. Eva Andersson Strand and Dr. Susanne Möller-Wiering kindly discussed with me the results of the analyses, advised and commented on the text, and I am very grateful for their help. I wish to thank the organizers of the interdisciplinary workshop 'Funerary Textiles. Towards a Better Method for in situ Study, Retrieval and Conservation', Dr. Magdalena M. Woźniak and Dr. Elsa Yvanez, both from the Polish Centre for Mediterranean Archaeology at the University of Warsaw and the Centre for Textile Research, University of Copenhagen, for inviting me to participate in the workshop and present my study. Finally, I would like to thank Dr. Sarah Clegg for correcting a draft of my English text.

## References

- Andersson Strand, E. (2015a). The basics of textile tools and textile technology—From fibre to fabric. In E. Andersson Strand & M.-L. Nosch (Eds.), *Tools, textiles and contexts. Investigating textile production in the Aegean and Eastern Mediterranean Bronze Age* (Ancient textiles series 21) (pp. 39–60). Oxbow Books.
- Andersson Strand, E. (2015b). From tools to textiles, concluding remarks. In E. Andersson Strand & M.-L. Nosch (Eds.), *Tools, textiles and contexts. Investigating textile production in the Aegean and Eastern Mediterranean Bronze Age* (Ancient textiles series 21) (pp. 139–144). Oxbow Books.
- Andersson Strand, E., & Nosch, M.-L. (Eds.). (2015). *Tools, textiles and contexts. Investigating textile production in the Aegean and Eastern Mediterranean Bronze Age* (Ancient textiles series 21.). Oxbow Books.
- Andersson Strand, E., Breniquet, C., & Michel, C. (2017). Textile imprints on bullae from Kültepe. In F. Kulakoğlu & G. Barjamovic (Eds.), *Movement, Resources, Interactions. Proceedings of the 2nd Kültepe International Meeting, Kültepe, 26–30 July 2015. Subartu XXXIX. Kültepe International Meetings 2* (pp. 87–104). Brepols, Turnhout.
- Banck-Burgess, J. (2020a). Textilien aus den Feuchtbodensiedlungen am Bodensee und in Oberschwaben. Textiles from the wetland settlements on Lake Constance and in upper Swabia. In J. Banck-Burgess & L.-M. Rösch (Eds.), *Verknüpft und zugenäht! Gräser, Bast, Rinde – Alleskönner der Steinzeit. Bound and stitched up! Grass, bast, bark – Stone Age all-rounders* (pp. 50–58). Archäologische Informationen aus Baden-Württemberg 82. Regierungspräsidium Stuttgart Landesamt für Denkmalpflege.
- Banck-Burgess, J. (2020b). Underrated. Textile making in Neolithic lakeside settlements in the northern Alpine foreland. In W. Schier & S. Pollock (Eds.), *The competition of Fibres: Early textile production in Western Asia, Southeast and Central Europe (10,000–500 BC)* (Ancient textiles series 36) (pp. 153–163). Oxbow Books.
- Barber, E. J. W. (1991). *Prehistoric textiles. The development of cloth in the Neolithic and Bronze Ages with special reference to Aegean*. Princeton University Press.
- Baxevasi, K. (1995). A Minoan Larnax from Pigi Rethymnou with religious and funerary iconography. In C. Morris (Ed.), *Klados: Essays in Honour of J. N. Coldstream, Bulletin of the Institute of Classical Studies, Supplement 63* (pp. 15–33). Institute of Classical Studies, University of London.
- Baxevasi-Kouzioni, K., & Markoulaki, S. (1996). Une tombe à chambre MR III à Pankalochori (nome de Réthymnon). *Bulletin de Correspondance Hellénique*, 120(2), 641–703. <https://doi.org/10.3406/bch.1996.4622>

- Benzi, M. (1999). Riti di Passaggio sulla Larnax dalla Tomba 22 di Tanagra? In V. La Rosa, D. Palermo, & L. Vagnetti (Eds.), *Επί πόντου πλαζόμενοι. Simposio italiano di Studi Egei dedicato a Luigi Bernabò Brea e Giovanni Pugliese Carratelli Roma, 18–20 febbraio 1998* (pp. 215–233). Scuola archeologica italiana di Atene.
- Bolohan, N., & Lazanu, C. C. (2018). Plant textiles in a grave mound of the Early Bronze Age in Eastern Romania. In M. Siennicka, L. Rahmstorf, & U. Ulanowska (Eds.), *First textiles. The beginnings of textile manufacture in Europe and the Mediterranean. Proceedings of the EAA Session Held in Istanbul (2014) and the 'First Textiles' Conference in Copenhagen (2015)* (Ancient textiles Series 32) (pp. 143–250). Oxbow Books.
- Breniquet, C. (2013). Functions and uses of textiles in the ancient near east. In M. L. Nosch, H. Koefoed, & E. Andersson Strand (Eds.), *Textile production and consumption in the ancient near east* (Archaeology, epigraphy, iconography. Ancient textiles series 12) (pp. 1–25). Oxbow Books.
- Burke, R. (2012). Looking for sea-silk in the Bronze Age Aegean. In M. L. Nosch & R. Laffineur (Eds.), *KOSMOS. Jewellery, adornment, and textiles in the Aegean bronze age. Proceedings of the 13th International Aegean Conference, University of Copenhagen, Danish National Research Foundation's Centre for Textile Research, 21–26 April 2010* (Aegaeum. Annales d'archéologie égéenne de l'Université de Liège et UT-PASP 23) (pp. 171–178). Peeters.
- Burke, B., & Chapin, A. P. (2016). Bronze Age Aegean cloth production: A cottage industry no more. In M. C. Shaw & A. P. Chapin (Eds.), *Woven threads. Patterned textiles of the Aegean Bronze Age* (Ancient textiles series 22) (pp. 18–20). Oxbow Books.
- Carington Smith, J. (1975). *Spinning, weaving and textile manufacture in prehistoric Greece—From the beginning of the Neolithic to the end of the Mycenaean ages; with particular reference to the evidence found on archaeological excavations* (Unpublished Ph.D. thesis). University of Tasmania.
- Carington Smith, J. (1977). Appendix 2: Cloth and mat impressions. In J. E. Coleman (Ed.), *Kephala. A late Neolithic settlement and cemetery. Keos I. Results of excavations conducted by the University of Cincinnati under the Auspices of the American School of Classical Studies at Athens* (pp. 114–127). American School of Classical Studies at Athens.
- Carington Smith, J. (1992). Spinning and weaving equipment. In W. A. McDonald & N. C. Wilkie (Eds.), *Excavations at Nichoria in Southwest Greece. Volume II: The Bronze Age occupation* (pp. 674–711). The University of Minnesota Press.
- Cavanagh, W., & Mee, C. (1998). *A private place: Death in prehistoric Greece. Studies in Mediterranean archaeology 125*. Paul Åströms Förlag.
- Crowfoot, G. M. (1954). Textiles, basketry, and mats. In C. Singer, E. J. Holmyard, & A. R. Hall (Eds.), *The history of technology. Volume I. From early times to fall of ancient empires* (pp. 413–455). Clarendon Press.
- de Wild, D. (2001). Appendix II. Textile remains on vases from tomb 1 and tomb 2C. In E. Karantzali (Ed.), *The Mycenaean cemetery at Pylona on Rhodes* (British archaeological reports international series 988) (pp. 114–116). BAR.
- Deshayes, J. (1966). *Argos, les fouilles de la Deiras. Études Péloponnésienes IV. Librairie philosophique J. Vrin*.
- Emery, I. (1980). *The primary structures of fabrics. An illustrated classification*. The Textile Museum.
- Fernández-Götz, M., & Grömer, K. (2021). Making cities, producing textiles: The late Hallstatt Fürstentum. In M. Gleba, B. Marín-Aguilera, & B. Dimova (Eds.), *Making cities. Economies of production and urbanization in Mediterranean Europe, 1000–500 BC* (pp. 329–343). McDonald Institute for Archaeological Research.
- Gleba, M. (2018). Textile cultures in Europe 1200–500 BC: A view from Greece. *Arachne*, 5, 14–23.
- Gleba, M., & Mannering, U. (2012). Introduction: Textile preservation, analysis and technology. In M. Gleba & U. Mannering (Eds.), *Textiles and textile production in Europe: From prehistory to AD 400* (Ancient textile series 12) (pp. 1–24). Oxbow Books.

- Grömer, K. (2016). The art of prehistoric textile making. The development of craft traditions and clothing in Central Europe. In *Veröffentlichungen der Prähistorischen Abteilung 5*. Natural History Museum Vienna.
- Grömer, K., & Kern, D. (2010). Technical data and experiments on corded ware. *Journal of Archeological Science*, 37, 3136–3145.
- Killen, J. T. (2007). Cloth production in late Bronze Age Greece: the documentary evidence. In C. Gillis & M. L. Nosch (Eds.), *Ancient Textiles, Production, Craft and Society, Proceedings of the First International Conference on Ancient Textiles, held at Lund Sweden and Copenhagen, Denmark, on March 19–23, 2003* (Ancient textiles series 1) (pp. 50–58). Oxbow Books.
- Lewartowski, K. (2000). *Late Helladic simple graves. A study of Mycenaean burial customs* (British archaeological reports international series 878). Archaeopress.
- Manning, S. W. (2010). Chronology and terminology. In E. H. Cline (Ed.), *The Oxford handbook of the Bronze Age Aegean (ca. 3000–1000 BC)* (pp. 11–28). Oxford University Press.
- Margariti, C., Moraitou, S., & Retsa, M. (2014). Overview of textiles excavated in Greece. In A. El Nemr (Ed.), *Textiles: History, properties and performance and applications* (pp. 259–276). Nova Science Publishers.
- Marinatos, S. (1967). *Kleidung, Haar- und Batracht. Archaeologia Homerica 1*. Vandenhoeck und Ruprecht.
- Mårtensson, L., Nosch, M.-L., & Andersson Strand, E. (2009). Shape of things: Understanding a loom weight. *Oxford Journal of Archaeology*, 28(4), 373–398.
- Moulhérat, C., & Spantidaki, G. (2009a). Cloth from Kastelli, Chania. *Arachne*, 3, 8–15.
- Moulhérat, C., & Spantidaki, G. (2009b). Archaeological textiles from Salamis: A preliminary presentation. *Arachne*, 3, 16–29.
- Moulhérat, C., & Spantidaki, G. (2016). Textiles de l'Âge du Bronze à l'époque romaine conservés en Grèce. In F. Blondé (Ed.), *L'artisanat en Grèce ancienne. Filières de production: bilans, méthodes et perspectives* (Archailogia 1695) (pp. 119–144). Presses Universitaires du Septentrion and Athènes – École Française d'Athènes, Villeneuve d'Ascq.
- Müller, W. (2004). Bemerkungen zur den Tonplomben und Siegelabdrücken auf Gefäßen und ‚Gewichten‘. In I. Pini (Ed.), *Kleinere griechische Sammlungen. Neufunde aus Griechenland und der westlichen Türkei. Ägina – Mykonos* (pp. 43–60). Corpus der minoischen und mykenischen Siegel V. Suppl. 3.1. Philipp von Zabern.
- Müller, W., & Pini, I. (1997). Die ‚Schnüre‘ in den Plomben und die Gegenstandsabdrücke. In: I. Pini (Ed.), *Die Tonplomben aus dem Nestorpalast von Pylos* (pp. 67–69). Philipp von Zabern.
- Mylonas, G. E. (1973). Ο ταφικός κύκλος Β' των Μυκηνών. *Αθήνα Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας* 73.
- Nosch, M.-L. (2012). From texts to textiles in the Aegean Bronze Age. In M.-L. Nosch & R. Laffineur (Eds.), *KOSMOS. Jewellery, adornment, and textiles in the Aegean Bronze Age. Proceedings of the 13th international Aegean conference, University of Copenhagen, Danish National Research Foundation's Centre for Textile Research, 21–26 April 2010* (Aegaeum. Annales d'archéologie égéenne de l'Université de Liège et UT-PASP 23) (pp. 43–53). Peeters.
- Panagiotakopulu, E., Buckland, P. C., Day, P. M., Dumas, C., Sarpaki, A., & Skidmore, P. (1997). A Lepidopterous cocoon from Thera and evidence for silk in the Aegean Bronze Age. *Antiquity*, 71, 420–429.
- Papadimitriou, N., Philippa-Touchais, A., & Touchais, G. (2015). Argos in the MBA and the LBA. A reassessment of the evidence. In A.-L. Schallin & I. Tournavitu (Eds.), *Mycenaean up to date. The archaeology of the North-Eastern Peloponnese — Current concepts and new directions* (Acta Instituti Atheniensis Regni Sueciae series 56) (pp. 161–184). Svenska Institutet vid Rom och Athen.
- Papadimitriou, N., Philippa-Touchais, A., & Touchais, G. (2020). The Mycenaean cemetery of Deiras, Argos, in a local and regional context. In J. M. A. Murphy (Ed.), *Death in late Bronze Age Greece: Variations on a theme* (pp. 60–88). Oxford University Press.
- Persson, A. W. (1931). *The Royal Tombs at Dendra near Midea. Acta Regiae Societatis Humaniorum Litterarum Lundensis 15*. CWK. Gleerup.



- Phialon, L., & Farrugio, S. (2005). Réflexions sur l'usage des larnakès et cercueils en Grèce Mycénienne. *Revue archéologique*, 40, 227–254. <https://doi.org/10.3917/arch.052.0227>
- Protonotariou-Deilaki, E. (1969). Θωλοτός τάφος Καζάρμας. *Αρχαιολογικά Ανάλεκτα εξ Αθηνών II*, 1, 3–6.
- Rahmstorf, L. (2008). *Kleinfunde aus Tiryns. Terrakotta, Stein, Bein und Glas/Fayence vornehmlich aus der Spätbronzezeit*. Forschungen und Berichte XVI. Reichert, Wiesbaden.
- Rahmstorf, L., Siennicka, M., Andersson Strand, E., Nosch, M.-L., & Cutler, J. (2015). Textile tools from Tiryns. In E. Andersson Strand & M.-L. Nosch (Eds.), *Tools, textiles and contexts. Investigating textile production in the Aegean and Eastern Mediterranean Bronze Age* (Ancient textiles series 21) (pp. 267–278). Oxbow Books.
- Rast-Eicher, A. (2005). Bast before wool: The first textiles. In P. Bichler, K. Grömer, R. Hofmann-de Keijzer, A. Kern, & H. Reschreiter (Eds.), *Hallstatt textiles. Technical analysis, scientific investigation and experiment on Iron Age textiles* (British archaeological report international series 1351) (pp. 117–132). BAR Publishing.
- Rast-Eicher, A., Karg, S., & Bender Jørgensen, L. (2021). The use of local fibres for textiles at Neolithic Çatalhöyük. *Antiquity*, 95(383), 1129–1144. <https://doi.org/10.15184/aqy.2021.89>
- Reichert, A. (2020). Textile materials in the Mesolithic and Neolithic and their processing. In W. Schier & S. Pollock (Eds.), *The competition of Fibres: Early textile production in Western Asia, Southeast and Central Europe (10,000–500 BC)* (Ancient textiles series 36) (pp. 165–179). Oxbow Books.
- Schliemann, H. (1878). *Mykenae: Bericht über meine Forschungen und Entdeckungen in Mykenae und Tiryns*. FA Brockhaus.
- Siennicka, M. (2015–2016). Étude d'empreintes de textile. In A. Philippa-Touchais, N. Papadimitriou, & G. Touchais (Eds.), *La Deiras. Bulletin de Correspondance Hellénique 139–140* (pp. 837–838).
- Siennicka, M. (2023). Flax and wool. Textile production in early bronze age Mainland Greece. In J. Banck-Burgess, E. Marinova, & D. Mischka (Eds.), *The significance of archaeological textiles. Papers of the international online conference 24th–25th February 2021. THEFBO II* (Forschungen und Berichte zur Archäologie in Baden-Württemberg Band 28) (pp. 141–164). Reichert 2023.
- Skals, I., Möller-Wiering, S., & Nosch, M.-L. (2015). Survey of archaeological textile remains from the Aegean and Eastern Mediterranean Area. Appendix A: Textile remains in the eastern Mediterranean area: Neolithic and chalcolithic. Appendix B: Textile remains in the eastern Mediterranean area: Bronze Age. In A. Andersson Strand & M.-L. Nosch (Eds.), *Tools, textiles and contexts. Investigating textile production in the Aegean and Eastern Mediterranean Bronze Age* (Ancient textiles series 21). Oxbow Books. pp. 61–74; pp. 385–401.
- Spantidaki, S. (2016). *Textile production in classical Athens* (Ancient textiles series 27). Oxbow Books.
- Spantidaki, S., & Margariti, C. (2017). Archaeological textiles excavated in Greece. *Archaeology in Greece 2016–2017. Archaeological Reports*, 63, 49–62. <https://doi.org/10.1017/S0570608418000054>
- Spantidaki, Y., & Moulhérat, C. (2012). Greece. In M. Gleba & U. Mannering (Eds.), *Textiles and textile production in Europe: From prehistory to AD 400* (Ancient textile series 12) (pp. 185–200). Oxbow Books.
- Spyropoulos, T. G. (1970). Ανασκαφή εις το μυκηναϊκόν νεκροταφείον της Τανάγρας. *Αρχαιολογικά Ανάλεκτα εξ Αθηνών III*, 2, 184–197.
- Spyropoulos, T. G. (1971). Ανασκαφή μυκηναϊκού νεκροταφείου Τανάγρας. *Πρακτικά της εν Αθήναις Αρχαιολογικής Εταιρείας*, 1969, 5–15.
- Spyropoulos, T. G. (1972). Ανασκαφή μυκηναϊκού νεκροταφείου Τανάγρας. *Πρακτικά της εν Αθήναις Αρχαιολογικής Εταιρείας*, 125 (1970), 29–36.
- Tzachili, I. (1997). *Υφαντική και υφάντρες στο Προϊστορικό Αιγαίο*. Πανεπιστημιακές Εκδόσεις Κρήτης.

- Ulanowska, A. (2020). Textile uses in administrative practices in Bronze Age Greece: New evidence of textile impressions from the undersides of clay sealings. In M. Bustamante-Álvarez, E. H. Sánchez López, & J. Jiménez Ávila (Eds.), *Purpureae Vestes VII. Textiles and dyes in antiquity. Redefining ancient textile handcraft. Structures, tools and production processes. Proceedings of the VII. The International Symposium on Textiles and Dyes in the Ancient Mediterranean World (Granada, Spain 2–4 October 2019)* (pp. 413–424). Universidad de Granada.
- Valmin, M. N. (1938). The Swedish Messenia expedition. In *Acta Regiae Societatis Humaniorum Litterarum Lundensis* 26. CWK Gleerup.
- Van Damme, T. (2012). Reviewing the evidence for a Bronze Age silk industry. In M.-L. Nosch & R. Laffineur (Eds.), *KOSMOS. Jewellery, adornment, and textiles in the Aegean Bronze Age. Proceedings of the 13th International Aegean Conference, University of Copenhagen, Danish National Research Foundation's Centre for Textile Research, 21–26 April 2010* (Aegaeum. Annales d'archéologie égéenne de l'Université de Liège et UT-PASP) (Vol. 23, pp. 163–169). Peeters.
- van den Brink, E. C. M., Beeri, R., Kirzner, D., Bron, E., Cohen-Weinberger, A., Kamaisky, E., Gonen, T., Gershuny, L., Nagar, Y., Ben-Tor, D., Sukenik, N., Shamir, O., Maher, E. F., & Reich, D. (2017). A late Bronze Age II clay coffin from Tel Shaddud in the Central Jezreel Valley, Israel: Context and historical implications. *Levant*, 49(2), 105–135. <https://doi.org/10.1080/00758914.2017.1368204>
- Vogelsang-Eastwood, G. (1999). The textile impressions from Geraki. In: Weingarten J, Crouwel JH, Prent M, Vogelsang-Eastwood G Early Helladic sealings from Geraki in Lakonia. *Oxford Journal of Archaeology*, 18, 371–374.
- Vollgraaf, W. (1904). Fouilles d'Argos. A. La nécropole mycénienne de la Deiras. *Bulletin de Correspondance Hellénique*, 28, 364–399.

**Malgorzata Siennicka** holds a PhD in Aegean Archaeology from the University of Warsaw. Her interests are in the prehistoric Aegean and Eastern Mediterranean, textile production, craftsmanship, early metrology, and architecture. She was a Marie Skłodowska-Curie Fellow at the Centre for Textile Research in Copenhagen (2013–2017), a leader of the research project 'First Textiles' (2013–2018), and an ERC Associate at the University of Göttingen (2017–2020).

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



## Chapter 12

# Naked Graves? Thoughts on the Recording and Reconstruction of Funerary Attire in the Early Iron Age of Southwestern Iberia



Francisco B. Gomes

**Abstract** Due to environmental, taphonomic, and cultural factors, the examples of preserved textiles in Early Iron Age funerary contexts in southwestern Iberia (ninth–sixth/early fifth centuries BCE) are very rare and fragmentary. For this reason, any attempt to understand the role of textiles in the tomb must necessarily rely on secondary evidence, particularly on the study of metal dress complements or fastenings. Three regional case studies—the necropolis of La Angorrilla (Seville province), the enclosure necropoleis of the Beja region (southern Portugal), and the necropolis of Medellín (Badajoz province)—show how good recording practices, both of archaeological and anthropological material, can result in significant insights into funerary attire, and even highlight the use of funerary wrappings. Based on these case studies, as well as other innovative work currently being developed on the study of metal dress complements, some methodological inferences can be made which could contribute to further developments of this research field.

**Keywords** Orientalizing period · Fibulae · Belt buckles · Funerary attire · Funerary wrappings

## 12.1 Introduction

It is a well-known fact that the conservation of archaeological textiles is severely affected by a number of environmental and taphonomic, but also cultural factors (Gillis & Nosch, 2007; Gleba & Mannering, 2012; Mannering & Skals, 2014). Such

---

F. B. Gomes (✉)

UNIARQ – Centre for Archaeology of the University of Lisbon, Lisbon, Portugal

School of Arts and Humanities of the University of Lisbon, Lisbon, Portugal

Foundation for Science and Technology, Lisbon, Portugal

© The Author(s) 2025

E. Yvanez, M. M. Wozniak (eds.), *Funerary Textiles in Situ*, Interdisciplinary Contributions to Archaeology, [https://doi.org/10.1007/978-3-031-69461-5\\_12](https://doi.org/10.1007/978-3-031-69461-5_12)

253

factors explain, at least to a certain extent, why despite the tremendous development of textile archaeology in the past few decades and the growing awareness of field archaeologists for the need to look out for, record, and preserve this type of material, our knowledge of ancient textiles remains uneven over time and space.

In this regard, the protohistory of the Iberian Peninsula, and especially of southwestern Iberia, represents one obvious blind spot,<sup>1</sup> in sharp contrast with other European areas in which Bronze and Iron Age textiles and textile cultures are much better known (e.g., Gleba, 2008, 2017, 2018; Grömer, 2010; Grömer et al., 2013; Dimova, 2018). A contribution dealing with this specific cultural context in a volume dedicated to *in situ* funerary textiles could therefore seem at best excessively optimistic and, at worst, misplaced.

However, the lack of preserved textiles has meant that, out of necessity, researchers dealing with funerary attire and other aspects of the use of textiles in the regional Early Iron Age (ninth/eighth–sixth/fifth centuries BCE) have had to develop and deploy other interpretive strategies, which, as will be mentioned below, have become much more fine-tuned in recent years. This period and area, with its varied and rich funerary record, can therefore be used as a relevant case study for possible strategies for the analysis of textile usage and dress in funerary settings in which the fabrics themselves are absent.

This contribution aims to use selected case studies to explore such strategies, thus contributing to the overall methodological reflection which structures this volume, while at the same time attempting to offer a possible framework for future research and analyses.

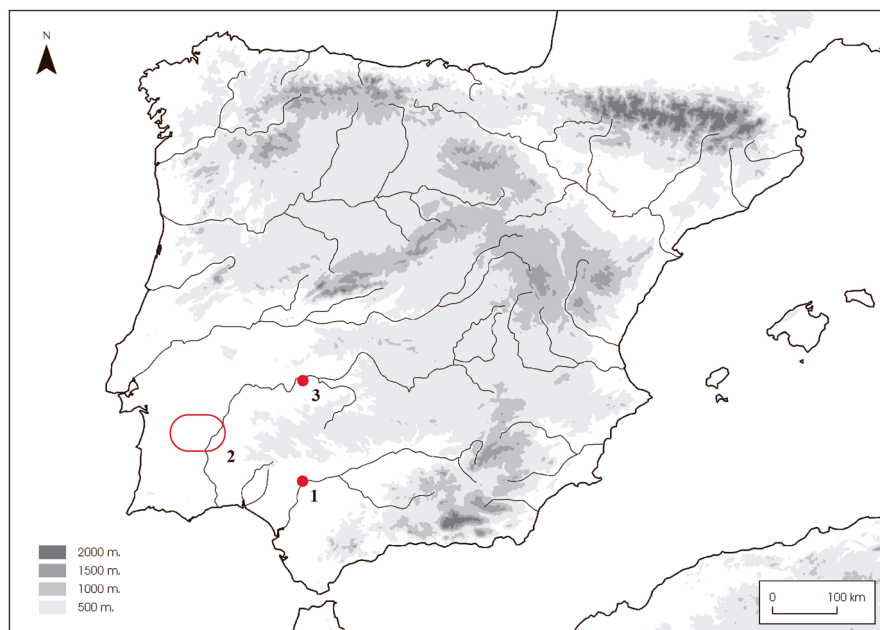
## **12.2 Funerary Practices, Textiles, and Dress in the Early Iron Age of Southwestern Iberia: An Introductory Overview**

In order to better understand the following discussion, it is important at this point to offer a necessarily brief sketch of the Early Iron Age funerary practices in this area. The main feature of these practices is, without a doubt, their diversity: diversity between more or less well-defined sub-regional areas, but also in some cases diversity within neighbouring regions, or even at a single site.

The area considered here can be broken into three main regions (Fig. 12.1), which, despite showing some degree of interconnectedness with regard to funerary practices and traditions, also show clear specificities. The first region to consider comprises the Lower Andalusia region of southern Spain, often considered the core

---

<sup>1</sup> See, however, Alfaro Giner, 2012: 341–42, with previous bibliography, Marín-Aguilera et al., 2019.



**Fig. 12.1** Location of the three case studies discussed in the text: 1—La Angorrilla (Alcalá del Río, Seville); 2—Enclosure necropoleis of the Beja region (southern Portugal); 3—Medellín (Badajoz)

area of the Orientalizing<sup>2</sup> horizon of southwestern Iberia. During the Early Iron Age, we find a complex array of funerary practices in this area, with variations both in time and in space (Torres Ortiz, 1999, 2004, 2017). The most representative funerary solutions include large *tumuli* covering multiple urn burials, pit cremations, *tumuli* covering pit cremations, cremations in simple ditches or *busta*, and in stepped ditches, as well as inhumations in simple ditches, sometimes also covered by *tumuli*, and chamber tombs, apart from other minor typologies which have been documented sporadically (Torres Ortiz, 1999: 127–148). Cremation was by far the predominant rite at most sites (Torres Ortiz, 1999: 149–150; Belén Deamos, 2001), although it was not by any means exclusive, and there are well-documented cases of communities in which inhumation was predominant (e.g., Fernández Flores et al., 2014).

<sup>2</sup> While the Orientalizing label has been the subject of much well-deserved criticism, it will be used here in the widest possible sense as a shorthand for a broad chrono-cultural horizon in which regional communities became embedded in transregional networks mediated by the Phoenician presence, in a process which helped shape their social, political, and cultural development. This use of the term is in no way meant to denote a culturally homogeneous reality, but rather a diverse and heterogeneous horizon that nonetheless shared a number of common traits derived and adapted from the Near Eastern and Phoenician culture repertoires, which were deployed as the building blocks of shared languages of power, status, and identity.

A second area of interest covers the southern Portuguese territory. Once again, we find a considerable diversity of funerary practices and traditions, although here perhaps a clearer organization in more or less discrete sub-regional groupings can be glimpsed (Arruda, 2004; Gomes, 2014–2015, 2016). On the one hand, we find a group of Orientalizing necropoleis concentrated in coastal areas, which are characterized by the widespread adoption of cremation (both *in situ*, in stepped ditches and simple *busta*, and in *ustrina* with the secondary deposition of remains in urns—Arruda et al., 2008; Gomes, 2016–2017, 2021) and show close ties to those in other areas of Southwestern Iberia. On the other hand, in the interior, occupied by essentially rural communities organized in fragmented, heterarchical sociopolitical networks, various traditions with more or less clear ties to ancestral funerary practices developed during this time. These include gregarious tumular necropoleis, with (apparently) mixed cremation and inhumation burials (Beirão, 1986; Correia, 1993; Arruda, 2001), cist necropoleis, exclusively housing inhumation burials (e.g. Barros et al., 2005; Deus & Correia, 2005; Cardoso & Gradim, 2006, 2008; see also Gomes, 2020), and enclosure necropoleis, also comprising almost exclusively inhumation burials (see contributions in Jiménez Ávila, 2017). Other *sui generis* funerary traditions can be found in specific areas as well (Mataloto, 2010–2011).

Finally, the third area to consider in this brief overview corresponds to the modern-day region of Extremadura, which, in the period in question, had very close ties with Lower Andalusia, and was an integral part of the southwestern Iberian Orientalizing *koine*. Here, we also find several distinctive modes of funerary deposition, including urn burials, pit cremations, cremations in *busta*, and tombs covered by stone tumular structures (Jiménez Ávila, 2001; Almagro-Gorbea, 2008a: 949–966; Menéndez Menéndez et al., 2013). The predominance of cremation seems even more pronounced here than in Lower Andalusia, as inhumation burials are documented only very rarely in the region (e.g., Almagro-Gorbea, 2008a: 966).

As mentioned above, in all of these funerary sites and groupings, preserved textiles are extremely rare due to environmental and cultural variables, such as the widespread (although not generalized) use of cremation, which further hindered the preservation of organic remains. The few examples of textiles from funerary settings documented so far come from only three sites (Table 12.1): the tumulus of Alcantarilla, in Carmona (Alfaro Giner, 1984: 144–147; Alfaro Giner & Tébar Megías, 2007), the necropolis of La Angorrilla, in Seville (Alfaro Giner, 2007, 2014), which will be discussed in further detail below, and the necropolis of Punic Cádiz (Alfaro Giner, 1983, 1984: 137–138), which falls outside the cultural and chronological limits of this presentation. Another textile fragment has been reported from the necropolis of La Joya, in Huelva, but was never published in detail and seems to have since been lost (Alfaro Giner, 1984: 137). Further very fragmentary examples have also been reported from recent excavations at Portuguese sites, but their study is still pending (Figueiredo & Mataloto, 2017: 372; Arruda et al., 2022).

Given these circumstances, any attempt to address the nature and reconstruction of funerary attire, and of the uses of textiles in burials more generally, must necessarily start from the observation of secondary evidence. While several types of evidence can offer insights into the general textile and dress cultures of the period and



**Table 12.1** List of textile remains from Orientalizing funerary contexts (eight–sixth centuries BCE in southwestern Iberia)

Site	Context	Textiles						References
		Condition	Weave	Material	Twist	Thread Ø	Thread count (weft/warp)	
Alcantarilla (prov. Seville)	Cremation burial under <i>tumulus</i> (undetermined gender)	Carbonized	Tabby (9 fragments)	Flax	S	0,1–0,3/0,4 mm	Variable: n. 108–10/21; n. 109–10/22; n. 110–8/22; n. 111–10/20; n. 112–10–21; n. 113–10–20; n. 114–NA; n. 115–10/15; n. 116–10/15–16,	Alfaro Giner (1984: 144–145, nn. 108–116)
		Carbonized	Tabby	Flax	Z	0,1 mm	29–30/26 to 32/22	
		Carbonized	Tabby	Flax?	I	0,1 mm	32/26	
		Carbonized	Tabby (pleated) (4 fragments)	Flax?	Z	0,1 mm	32/8–10	
		Carbonized	Tabby (pleated) with sewn appliqué	Flax?	I	0,1 mm	32/8	
		Carbonized	Tabby	Flax? (One fragment w/possible decorative threads of dyed wool)	Z	0,1–0,15 mm (warp) / 0,2–0,3 mm (weft)	38–40/20–26	
		Carbonized	Tabby	Flax?	S2z	0,3–0,4 mm (warp) / 0,3–0,6 mm (weft)	33–34/9	
		Carbonized	Tabby	Flax?				

(continued)

Table 12.1 (continued)

Site	Context	Textiles						References
		Condition	Weave	Material	Twist	Thread Ø	Thread count (weft/warp)	
La Angorrilla (prov. Seville)	Tomb 29 (inhumation, likely of a female individual)	Mineralized	Tabby?	Flax? Hemp?	S	0,2–0,3mm (warp) / 0,3–0,4 mm (weft)	14/14	Alfaro Giner (2014)
La Joya (prov. Huelva)	Tomb 9 ('princely' chamber tomb) (undetermined gender)	Unknown (currently lost)	Tabby	Flax	S	NA	NA	Alfaro Giner (1984: 137)

area considered here (Ferrer Albelda, 2022), the main source of information for the specifically funerary uses of textile elements comes mostly from non-textile dress complements such as fibulae and other fastenings, namely belt buckles (Fig. 12.2).

Such elements are quite well represented in the regional funerary record, but unfortunately seldom have any adhered mineralized textile remains (for the few exceptions, see above). They indicate nonetheless that the deceased were buried or cremated wearing a relatively specific funerary attire, although in other cases they can also point towards other uses of textiles in the tombs (see below). All in all, when carefully considered, they can offer some valuable insights that form the focus of this contribution.

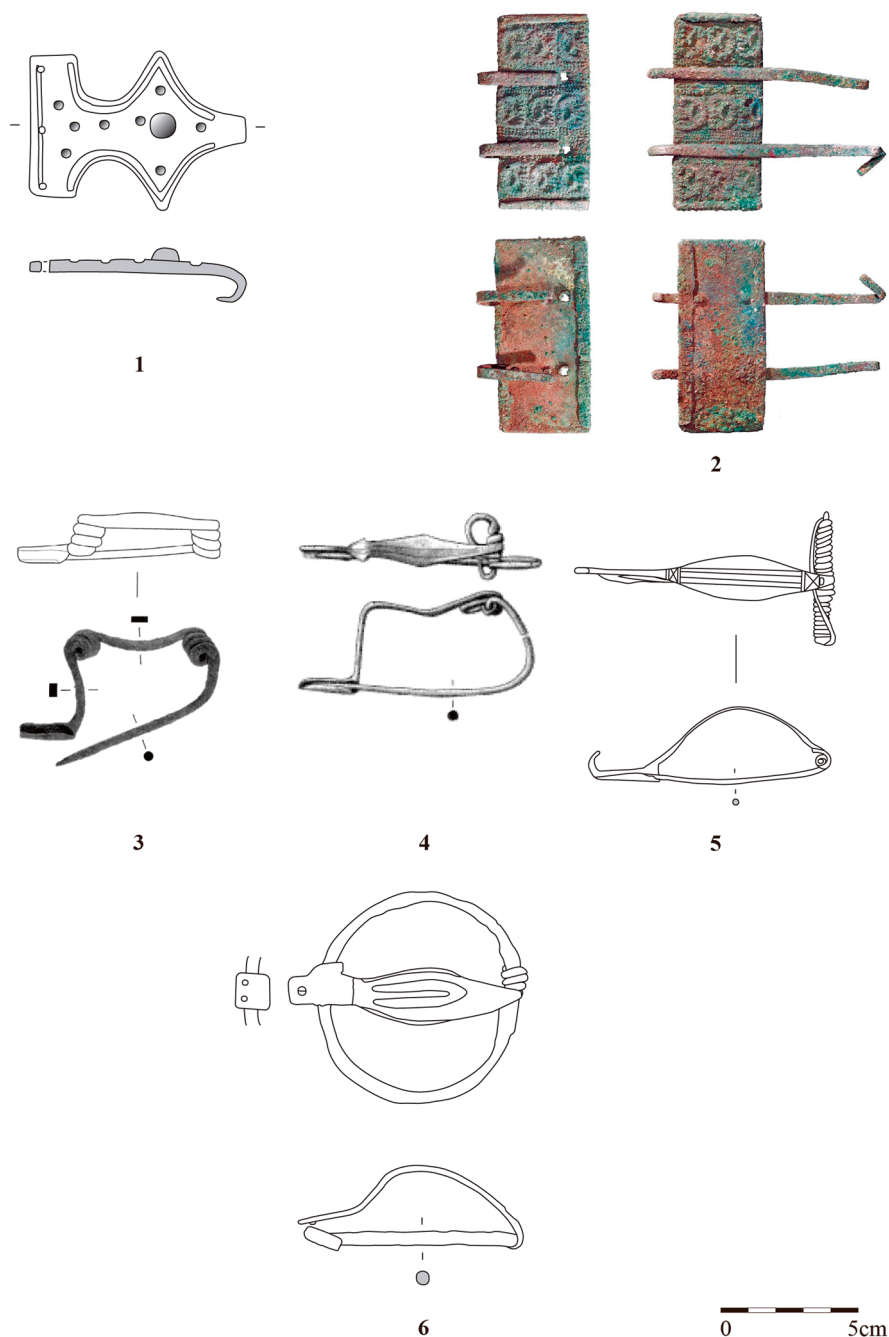
The potential of these and other elements for an in-depth assessment of funerary attire has, however, been hindered by the lack of good contextual data and the absence of appropriately detailed records of their position in funerary contexts. It is worth noting that many of the key sites dating to the period under analysis were excavated at a comparatively early date. This resulted in documentation that falls below current standards, while in other cases the excavations—especially comparatively recent ones—are not yet published in detail.

These dress complements have therefore been studied mostly from the point of view of typology, technology, chronology (for fibulae: Ruiz Delgado, 1989; Storch de Gracia, 1989; da Ponte, 2006; for belt buckles: Cerdeño Serrano, 1978, 1981) and sometimes as cultural or ethnic markers. Their relation to dress and, more generally, to textiles, has remained a largely unaddressed and taken-for-granted issue (see, however, Ferrer Albelda, 2022). Fortunately, in the past few years, the identification and/or publication of funerary sites extensively excavated with modern methodologies, and for which a careful record has been produced, has mitigated this dearth of data, and shed new light on the role of textiles and dress in the Early Iron Age tombs of this region. In this context, three selected case studies can be highlighted, covering the three main regions listed above (Fig. 12.1). From each of them, valuable data can be gathered and analysed that can contribute to the subject of this volume and, more specifically, of this chapter.

## 12.3 Textiles and Dress in Early Iron Age Funerary Settings: Three Case Studies

### 12.3.1 *La Angorrilla (Alcalá Del Río, Sevilla)*

The first case study is the necropolis of La Angorrilla, located in the Lower Andalusia region. This funerary area, related to the settlement of Alcalá del Río (ancient *Ilipa*), was used from the mid-seventh to the mid-sixth centuries BCE. Between 2003 and 2004, a total of 69 tombs were excavated at this site, most of which—56 in total—contained inhumation burials, while 12 were *in situ* cremations in *busta* and a single example housed an urn burial (Fernández Flores et al., 2014b, c). The results of this



**Fig. 12.2** Examples of the most characteristic Early Iron Age metallic fastenings/dress complements discussed in the text: 1—‘Celtic’-type belt buckle (Vinha das Calças 4, after Arruda et al., 2017); 2—‘Tartessian’-type belt buckle (Palhais, after Santos et al., 2017); 3—Double spring fibula (Monte do Bolor 1–2, after Soares et al., 2017); 4—‘Alcores’-type fibula (Poço Novo 1, after Figueiredo & Mataloto, 2017); 5—‘Acebuchal’-type fibula (Vinha das Calças 4, after Arruda et al., 2017); 6—Annular Hispanic fibula (Vinha das Calças 4, after Arruda et al., 2017)

fieldwork were presented in a comprehensive monographic volume (Fernández Flores et al., 2014), which offers detailed documentation of each single tomb, including data on its fill and the position of all documented objects within the tomb, including in relation to the human remains (Fernández Flores et al., 2014d). Furthermore, the latter were carefully documented *in situ* and subjected to an in-depth study, thus producing an uncommonly detailed bioanthropological picture (López Flores, 2014).

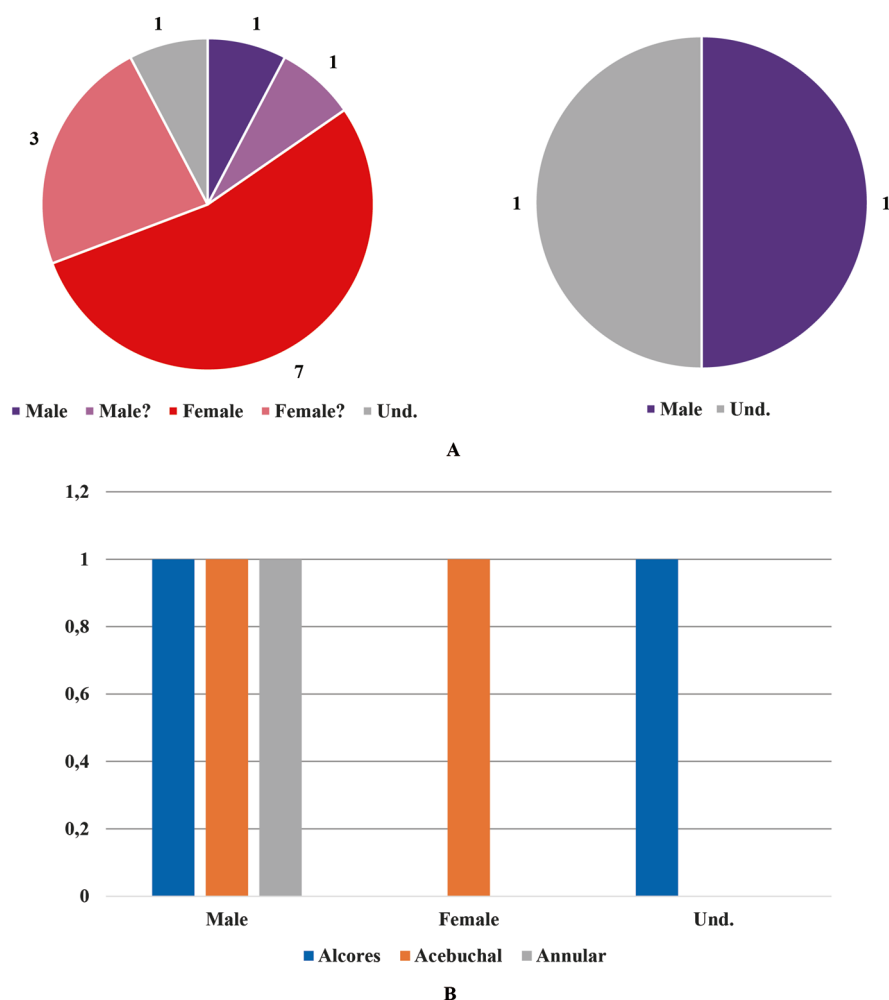
For the purpose of this discussion, it should be highlighted that this necropolis yielded a significant number of metallic dress complements, including two particular groups of artefacts usually interpreted as belt buckles (Ferrer Albelda & de la Bandera Romero, 2014a): the so-called ‘Tartessian’ and ‘Celtic’ belt buckles.<sup>3</sup>

The relatively good degree of preservation of the material from La Angorrilla gives some interesting insights into the actual use of these metallic fastenings, corroborating the use of the so-called ‘Celtic’ type for belts likely made of some hide material (possibly leather) and decorated with other metallic appliquéés, the outline of which was well preserved (Fernández Flores et al., 2014d: 172 and 188). As for the so-called ‘Tartessian’ type, one of the examples from La Angorrilla still had the remains of a mineralized linen—or possibly hemp—fabric (apparently a tabby) adhering to it (Alfaro Giner, 2014). In light of this observation, one may wonder whether, instead of belts, these pieces were used as fastenings for some type of sash, or other types of garments altogether. However, as we will see, the documentation from La Angorrilla also suggests other functional hypotheses.

Thanks to the excellent bioanthropological record produced during the excavations at La Angorrilla, it is possible to establish a gendered profile for the use of both of these types of fastenings. The documentation shows a strong trend associating each type to a specific sex (Fig. 12.3a): ten out of 13 ‘Tartessian’ buckles (c. 77 per cent) were retrieved from secure or likely female burials, but only two were documented with male or possibly male burials (c. 15 per cent), while the remaining example was recovered along with an individual whose sex could not be determined. For the ‘Celtic’ buckles, and despite the small size of the sample (only two examples), a possible association with male individuals can be suggested (one example was found in a male grave, while the other comes from the grave of an individual of undetermined sex) (Fernández Flores et al., 2014c: 284–286 and 290–291, see also Ferrer Albelda & de la Bandera Romero, 2014a: Tables 1 and 2).

---

<sup>3</sup>It has been suggested that the textiles from the Cádiz sarcophagus could be integrated into the textile tradition considered here (Ferrer Albelda, 2022). However, and even if one disregards the ongoing debates about the ethnic and cultural make-up of the Early Iron Age communities of Southwestern Iberia and particularly the issue of whether there were differentiated Phoenician and indigenous communities in the Lower Andalucía region (see, for example, the contributions in Campos & Alvar, 2013), the material from Cádiz is later than the other examples considered here. The Cádiz sarcophagus can in fact be firmly dated well into the fifth century BCE (Almagro-Gorbea et al., 2010), and the associated textile finds must therefore be interpreted in the framework of their Punic/ Late Iron Age historical context, even if their technical characteristics point to their integration in a common textile culture.



**Fig. 12.3** Gendered associations of the belt buckles (a) and fibulae (b) from the necropolis of La Angorrilla. (Data extracted from Fernández Flores et al., 2014)

As will be shown below, this is in line with the findings from other roughly contemporary contexts.

La Angorrilla has also yielded a relatively small but interesting assemblage of fibulae, corresponding to some of the more common models developed during the Early Iron Age of this region. These include the so-called ‘Alcores’, ‘Acebuchal’, and Annular-Hispanic types (Ferrer Albelda & de la Bandera Romero, 2014b). Again, anthropological data gives us some insights into the associations of these fibulae with male and female dress (Fig. 12.3b). Overall, an association with male attire is apparent (three out of five fibulae, i.e. 60 per cent, were retrieved from male burials, while only one, i.e. 20 per cent, comes from a female burial). With the



limited data available, only the ‘Acebuchal’-type fibulae can be shown to have been deposited with both sexes, as one example was retrieved from a male tomb and another from a female tomb (Fernández Flores et al., 2014c: 284–286, see also Ferrer Albelda & de la Bandera Romero, 2014b: Table 1).

The careful recording and study of the archaeological and anthropological remains from La Angorrilla seem, therefore, to suggest the existence of different preferential funerary attires for men and women. The former sported bronze-decorated leather belts with ‘Celtic’-type buckles and often some type of garment fastened with a fibula, while women potentially wore belts or sashes with ‘Tartessian’ buckles, and only rarely used garments—possibly outer garments(?)—fastened with fibulae.

With these insights in mind, there is perhaps more to be said about these different types of fastenings and their relationship to the use of textiles in burial contexts. In fact, so far we have seen how the exemplary record produced during the excavation of La Angorrilla can further our understanding of funerary attire along somewhat traditional lines, as even in the absence of positive evidence, the use of buckles and fibulae as parts of the (funerary) costume was always posited and accepted.

However, the data from La Angorrilla—and specifically the anthropological data—goes beyond this traditional analysis. The careful consideration of the position and articulation of skeletal remains in the inhumation tombs of this necropolis has demonstrated the high probability of the use of some type of funerary wrappings in at least two-thirds of the burials (López Flores, 2014: 569). The level of joint articulation documented in such a significant proportion of the tombs cannot be accounted for merely by the fact that the deceased were buried fully clothed. On the contrary, it suggests that they were further wrapped in some sort of wrap or shroud (López Flores, 2014: 569), a use of textiles in a funerary setting which, as far as could be ascertained, had never been posited for the area and period considered here based on positive evidence until the publication of this site.

What is more, the careful recording of the position of metallic fastenings within the tombs for which the use of wrappings has been posited has highlighted that ‘Tartessian’-type belt buckles are seldom positioned where one would expect them to be if they were part of belts or sashes. As duly noted by the authors of this study, their extraneous positions—behind (five examples) or in front (two examples) of the deceased’s legs, on top of the skull (four cases), or at the feet of the corpse (two cases) (Fernández Flores et al., 2014c: 284) (Fig. 12.4; Table 12.2)—can be seen as a key indication that these ‘buckles’ were used at times as the fastenings for burial wrappings rather than for belts, sashes, or other garments. A similar use can perhaps be posited for at least some of the fibulae, as has been suggested for the next case study.



**Fig. 12.4** Examples of the position of ‘Tartessian’ belt buckles in the tombs of La Angorrilla: (a) behind the legs (Tomb 14); (b) in front of the legs (Tomb 29); (c) on top of the skull (Tomb 17); (d) at the feet (Tomb 31). (After Fernández Flores et al., 2014d)

**Table 12.2** Position of ‘Tartessian’ belt buckles in the tombs of La Angorrilla

Context	Anthropological data	Position
Tomb 7	Cremation of an adult individual of undetermined sex	At the feet (?)
Tomb 14	Inhumation burial of a mature adult female	Behind the legs
Tomb 17	Inhumation burial of a young adult female	On top of the skull
Tomb 19	Inhumation burial of an adult, possibly male	On top of the skull/behind the legs
Tomb 22	Inhumation burial of a young adult female	In front of the legs
Tomb 27	Inhumation burial of a young adult female	Behind the legs
Tomb 29	Inhumation burial of a young adult, possibly female	In front of the legs
Tomb 31	Inhumation burial of a young adult female	In front of the feet
Tomb 33	Inhumation burial of a young adult male	On top of the skull
Tomb 39	Inhumation burial of a young adult female	Behind the legs
Tomb 42	Inhumation burial of a mature adult female	Above the skull
Tomb 43	Inhumation burial of an adult, possibly female	Behind the legs

Data extracted from Fernández Flores et al. (2014)

**12.3.2    *The Enclosure Necropoleis of the Beja Region (Southern Portugal)***

The second case study considered here comes from Southern Portugal and concerns a group of funerary sites dated between the late seventh and the late sixth/early fifth centuries BCE, identified and excavated during the last fifteen years or so in the Beja region of the Lower Alentejo province. The construction of the irrigation system connected to the Alqueva dam across the Guadiana River has resulted in the discovery of a large number of Iron Age sites, including a group of very characteristic enclosure necropoleis, of which some two dozen examples have been excavated.

Although the mass of data produced during this salvage work is still being processed and studied, important preliminary reports have already been published (Santos et al., 2009, 2017; Arruda et al., 2017; Soares et al., 2017; Figueiredo & Mataloto, 2017; Pereiro et al., 2017; Melo & Silva, 2021; Valério et al., 2021) and show the high potential of the data for our present discussion on funerary attire.

Several of these necropoleis have yielded metallic dress complements typologically very similar to the ones discussed above, including, yet again, both the characteristic belt-buckle types of this period. For some of these necropoleis, the preliminary results of anthropological analyses are already available, and they once again allow us to address the gendered associations of these elements (Table 12.3, with bibliography). The available data reinforces the pattern we saw before at La Angorrilla, with a strong association between the ‘Tartessian’ type and female burials, and the rarer ‘Celtic’ type with male individuals. An exceptional find of a well-preserved belt from the necropolis of Vinha das Calças (Arruda et al., 2017: 205 and Fig. 13B, Arruda et al., 2022: Fig. 16), similar to the ones from La Angorrilla

**Table 12.3** Gendered associations of the fibulae retrieved from the enclosure necropoleis of the Beja region

	“Tartessian”			“Celtic”		
	♀	♂	Und.	♀	♂	Und.
Palhais (Santos et al., 2017)	1	—	—	—	—	—
Vinha das Calças 4 (Arruda et al., 2017)	3	—	1	—	1	1
Monte do Bolor 1–2 (Santos et al., 2017)	—	—	2	—	—	—
Poço da Gontinha 1 (Figueiredo & Mataloto, 2017)	1	—	—	—	—	—
Poço Novo 1 (Figueiredo & Mataloto, 2017)	2	—	—	—	—	—
Esfola (Melo & Silva, 2021; Valério et al., 2021)	—	—	2	—	—	—
<b>Total</b>	<b>7</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>1</b>
%	<b>58,3</b>	<b>0</b>	<b>41,7</b>	<b>0</b>	<b>50</b>	<b>50</b>

**Table 12.4** Gendered associations of the belt buckles retrieved from the enclosure necropoleis of the Beja region

	Double spring			Alcores			Acebuchal			Annular hispanic		
	♀	♂	Und.	♀	♂	Und.	♀	♂	Und.	♀	♂	Und.
Palhais (Santos et al., 2017)	—	—	—	1	—	—	—	—	—	—	—	—
Vinha das Calças 4 (Arruda et al., 2017)	—	—	—	—	—	—	—	3	2	—	—	1
Monte do Bolor 1–2 (Santos et al., 2017)	—	1	1	—	—	—	1	—	—	—	—	—
Pardieiro (Figueiredo & Mataloto, 2017)	—	—	—	—	—	—	—	—	—	—	—	1
Poço Novo 1 (Figueiredo & Mataloto, 2017)	—	—	—	—	—	1	—	—	—	—	—	—
Fareleira 2 (Figueiredo & Mataloto, 2017)	—	—	—	—	—	—	—	1	—	—	—	—
Fareleira 3 (Figueiredo & Mataloto, 2017)	—	—	—	—	—	—	—	1	—	—	—	—
Esfola (Melo & Silva, 2021; Valério et al., 2021)	—	—	—	—	1	—	1	—	—	—	—	—
<b>Total</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>
%	<b>0</b>	<b>50</b>	<b>50</b>	<b>~33</b>	<b>~33</b>	<b>~33</b>	<b>22,2</b>	<b>55,6</b>	<b>22,2</b>	<b>0</b>	<b>0</b>	<b>100</b>

mentioned above, should also be noted here, as it offers yet another glimpse into the nature and decoration of the belts to which the latter type was affixed.

These enclosure necropoleis have also offered a significant number of fibulae, for which a wider range of models is attested. These include examples from the double-spring, ‘Alcores’, ‘Acebuchal’, and Annular-Hispanic types (Arruda et al., 2022, with bibliography). Despite this greater diversity, the gendered association of this material seems similar to the one observed at La Angorrilla, as most types of fibulae are predominantly associated with male individuals (Table 12.4, with bibliography).

The theoretical reconstruction of gendered associations for these dress and textile complements at the southern Portuguese sites is therefore quite similar to what we found at the Lower Andalusian site, even perhaps showing a more pronounced division of elements along gender lines, at least as far as belt buckles are concerned.

This being said, and while the full quantitative data are not yet available, the careful recording of the human remains in these necropolis—made by professional physical anthropologists, as mandated by Portuguese Law—has once again yielded indications for the use of funerary wrappings in several tombs (Figueiredo & Mataloto, 2017: 387). The position of some of the metallic elements mentioned before—in this case, particularly fibulae—suggests that they were used not as dress complements, but rather as fastenings for some type of funerary wrapping.

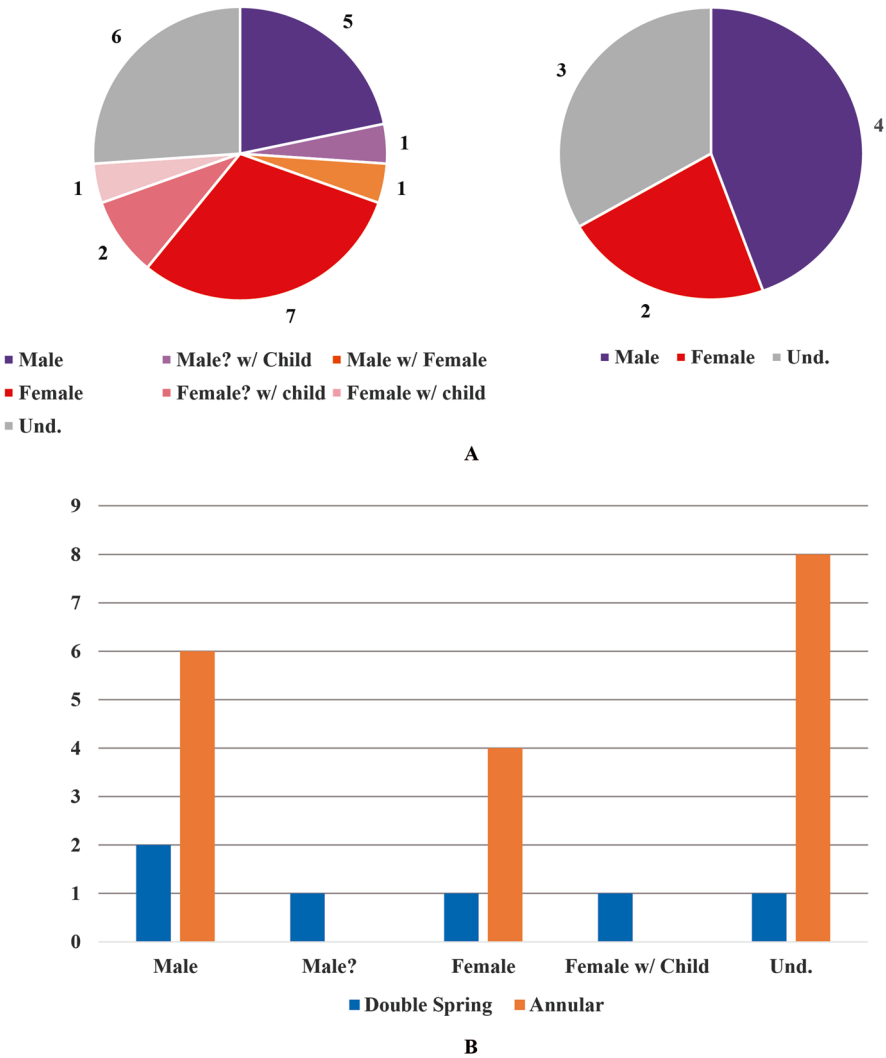
### 12.3.3 *Medellín (Badajoz)*

So far, the two case studies already presented were (mostly) inhumation necropoleis, so it seems useful to add here a third example which represents the potential of cremation necropoleis for this discussion. The most obvious candidate for the region and period under study is the necropolis of Medellín, in the Spanish region of Extremadura. This is by far one of the best studied and published Early Iron Age funerary assemblages in southwestern Iberia.

The highly detailed publication of the 212 tombs excavated in the 1969, 1970, 1982, and 1985–1986 campaigns (Almagro-Gorbea, 2008b), which span the period between the second quarter of the seventh century and the third quarter of the fifth century BCE, has become a benchmark for scholarship. It offers a clear example of how a careful field record and an integrated interdisciplinary study of the findings—including stratigraphic analyses, material, and anthropological studies—can return invaluable data despite the ravages of the funeral pyre.

This necropolis has yielded a large assemblage of metallic dress complements, of roughly the same types as previously discussed, as well as other types closely related to them, including a substantial number of belt buckles (López Ambite, 2008). Despite the effect of cremation on the remains, the valuable anthropological record recovered (Reverte Coma, 2008) allows for a consideration of the gendered associations of these elements. In this case, while aligning with the panorama obtained from the previous sites, the sexual division of dress objects seems somewhat more flexible in this relatively peripheral area of the regional Orientalizing *koine* (Fig. 12.5a).

Here, a more substantial percentage of ‘Tartessian’ buckles were found with male (or likely male) individuals—six out of 23 examples, or roughly 23 per cent of the total—but ten examples, amounting to 43.5 per cent of the total, do come from female, or likely female, burials, with one further example having been retrieved from a double female and male burial. On the other hand, two ‘Celtic’ belt buckles out of nine (c. 22.2 per cent) were retrieved along with female individuals, against four (c. 44.4 per cent) which come from male burials (López Ambite, 2008:



**Fig. 12.5** Gendered associations of the belt buckles (a) and fibulae (b) from the necropolis of Medellín. (Data extracted from López Ambite, 2008 and Torres Ortiz, 2008)

Fig. 632). It shows very clearly that overarching mechanistic generalizations regarding the composition of male and female funerary attire should be avoided.

The necropolis of Medellín has also yielded a significant number of fibulae, namely of the double-spring and Annular-Hispanic types (Torres Ortiz, 2008); however, some of the more common types found at other sites (see above) are curiously absent here, again highlighting the specificities of local tastes.

With regard to their gendered associations, the fibulae, just like the belt buckles, appear to show a less clear-cut picture than the one documented at other sites



(Fig. 12.5b). Double spring fibulae, on the one hand, retain an (although by no means exclusive) association with male burials, with three examples (50 per cent) coming from male graves against two (33.3 per cent) from female or double, female and child, graves. On the other hand, the Annular Hispanic fibulae (which, it should be noted, were rare at the sites discussed above), seem often to accompany both men (six examples, c. 33.3 per cent) and women (four examples, c. 22.2 per cent) (Torres Ortiz, 2008: Fig. 639).

In light of these data, Medellín does not entirely contradict the trends found elsewhere in southwestern Iberia. However, this site, which holds a particular position as a central node in a peripheral area of the overall Orientalizing sociopolitical network of this period, shows a more flexible approach to the adoption and deployment of these specific dress complements. It can thus offer us an insight into slight variations in the norms, fashions, and tastes relating to dress. This is in itself a very interesting fact, well worth further exploration in the future, as it moves us away from the identification of these fastenings as fossil-guides of monolithic ethnic or cultural identities, and towards the realm of locally rooted and socially negotiated practices and tastes regarding the body, status, and personal image.

### 12.3.4 *A Brief Summary of the Case Studies*

The three case studies highlighted above clearly show that, even when environmental and/or cultural conditions dictate the almost complete loss of archaeological textiles, secondary evidence can still give us valuable insights into the use and role of textiles in the tomb. However, to achieve as good an understanding of that use as possible, a careful recording of different aspects is necessary, including, but not limited to:

- (a) the position of objects in the tomb—in the case studies discussed here, conventional drawing and especially photography have proven key to the interpretation of elements relating to funerary dress and wrappings, but other, more detailed recording techniques, such as photogrammetry (which is only now beginning to make headway in the recording of Early Iron Age funerary contexts in the area considered here; see, for instance, Marzoli & García-Teyssandier, 2019), have the potential to further improve that interpretation;
- (b) good spatial and stratigraphic records, allowing the sequencing of dress-related elements, and therefore the study of evolution in dress styles;
- (c) the production of good anthropological records and studies whenever possible—these are fundamental not only for studies regarding the association of each class of objects with a specific gender or age group, but also, as shown above, to detect and analyse the possible usage of funerary wrappings in contexts where no textile remains are preserved.

As the quality standards of archaeological excavations regularly keep improving, new recording techniques will be more and more accessible, and they will become

a more integral part of the standard toolkit of field archaeologists. We can therefore expect an influx of new data which will widen our understanding of the use of garments and textiles in general in the Early Iron Age funerary practices of southwestern Iberia.

The examples presented here are, in fact, only a drop in the ocean, and the sample of metallic dress complements discussed above, although by no means small, is comparatively limited in scope. Now that the means to produce a good-quality record have become more widespread, one challenge laying ahead is to obtain larger datasets which should allow a more robust and secure approach to issues such as variations in dress related to gender, age, and life stage, apart from the more traditional status and ethnicity factors.

## 12.4 Final Remarks on the Present State and the Future of Research on Early Iron Age Funerary Dress and Textiles

In closing this contribution, it seems necessary to briefly take a step back and consider that, however bright the prospects are for future interventions, we are still left with a mass of data retrieved during older excavations during which less detailed records were produced, but which we cannot simply overlook. It therefore seems clear that we also need to deploy all the means at our disposal to recover as much information as possible from these data.

One way to move forward in the (re)assessment of this material is to deploy analytical strategies which strike a balance between the need to study specific assemblages and their internal characteristics, and the equally necessary task of going beyond the specificities of local contexts to draw larger-scale comparisons. These are necessary to detect similarities and differences, patterns and deviations, and ultimately to achieve a nuanced vision of the uses of textiles—whether as part of garments, wrappings, or fulfilling other functions—in funerary contexts.

*Corpora* building, although not necessarily trendy at times, remains a useful methodological approach in this regard. However, it seems increasingly vital to move beyond surveys strictly focusing on broad morpho-typological aspects and the geographical distribution of objects and types, to go towards much more broad-spectrum approaches.

For the Iron Age Iberian Peninsula, good examples of this have become available in recent years (e.g. Graells & Lorrio, 2017; Graells et al., 2018, 2022), illustrating the undeniable virtues of a robust process of *corpus* building. At the core of these works lies a strong contextual approach cross-referencing different strands of evidence, from morphological and stylistic analysis, and geographical distribution, to technological analyses, and the study of repairs. Such an approach is instrumental in achieving a renewed understanding of the role and significance of dress

complements and their place in the overall dress regimes of Pre-Roman Iberian communities.

Additionally, there are still further avenues of enquiry that remain almost entirely unexplored for this area and period, including, for example, experimental archaeology (see Peacock, 2001; Andersson Strand, 2009; Demant, 2009; for an Iberian case study, see Demant, 2014). One example of a specific research question which could be addressed through experimentation concerns the meaning of the diversity of contemporaneous Early Iron Age fibulae models, which is still to be ascertained. In fact, at some times during this period, different fibulae were used at the same time, often at the same sites. No entirely convincing explanation has been put forward for this fact, but perhaps looking at the structure, the mechanics, and the morphometric patterns of those models could reveal whether each of them was better suited for a specific set of circumstances (finer vs thicker fabrics/garments; plain vs pleated/draped garments; inner vs outer garments; etc.). This would have obvious implications for the reconstruction of textiles and dress at the time in question.

Other factors must have played a role in specific forms of dress, such as seasonality, but remain entirely unanalysed, certainly due to the difficulty in accessing relevant and reliable information. However, in cases where the evidence suggests a meaningful solar orientation of tombs (e.g. Estebán López, 2014), data regarding the orientation of specific burials, when cross-referenced with the type of dress complements present (or the lack thereof), could conceivably—although by no means certainly—help identify seasonal changes in dress.<sup>4</sup>

These notes are not meant as a comprehensive survey of the possibilities for the study of the use of textiles in Early Iron Age burials through indirect evidence. They nonetheless aim to highlight that, despite having come a long way, there is still room for growth and for new approaches. In fact, and while the absence of preserved textile remains in contexts such as the ones described here can be seen as an obstacle, it can also be the required stimulus to develop new and innovative research lines, which will necessarily be predicated on ever-improving recording techniques, on interdisciplinary dialogue and collaboration, but perhaps first and foremost on the curiosity and creative reasoning of those studying and researching these topics.

**Acknowledgments** This contribution results from work developed in the framework of the COST Action *EuroWeb—Europe through Textiles. Network for an Integrated and Interdisciplinary Humanities* (CA19131), and the *Made in the Mediterranean* project, financed by the Portuguese Foundation for Science and Technology through a Scientific Employment Stimulus Contract (CEECIND/01109/2018).

This work was financed by Portuguese funds through FCT—Fundação para a Ciência e a Tecnologia in the framework of the projects UIDB/00698/2020 (<https://doi.org/10.54499/UIDB/00698/2020>) and UIDP/00698/2020 (<https://doi.org/10.54499/UIDP/00698/2020>).

---

<sup>4</sup>Such a line of enquiry may prove entirely unfruitful, as cultural conventions regarding the appropriate funerary attire may override other practical considerations. It is, nonetheless, an avenue of enquiry worth exploring, even if only to discard it. In any case, a negative result in such studies would be further evidence of the codified and symbolic nature of funerary attire.

I would like to express my gratitude to the editors, Magdalena Wozniak, and Elsa Yvanez, for their invitation to participate in the Interdisciplinary Workshop *Funerary Textiles. Towards a Better Method for In Situ Study, Retrieval, and Conservation* and in this volume, and to the anonymous reviewers for their useful comments and suggestions.

## References

- Alfaro Giner, C. (1983). Fragmentos textiles del sarcófago antropomorfo femenino de Cádiz. In *Homenaje al Prof. Martín Almagro Basch* (pp. 281–289). Ministerio de Cultura.
- Alfaro Giner, C. (1984). *Tejido y Cestería en la Península Ibérica desde la Prehistoria hasta la Romanización*. CSIC.
- Alfaro Giner, C. (2007). A study of textile remains from the Necrópolis in Angorrilla, Alcalá del Río, Seville, Spain. *Archaeological Textiles Newsletter*, 45, 2–7.
- Alfaro Giner, C. (2012). Spain. In M. Gleba & U. Mannering (Eds.), *Textiles and textile production in Europe from prehistory to AD 400* (pp. 334–348). Oxbow.
- Alfaro Giner, C. (2014). Estudio de los restos textiles de la Angorrilla. In Á. Fernández Flores, A. Rodríguez Azogue, M. Casado Ariza, & E. Prados Pérez (coords), *La necrópolis de época tartésica de La Angorrilla, Alcalá del Río, Sevilla* (pp. 639–644). University of Seville.
- Alfaro Giner, C., & Tébar Megías, E. (2007). Phoenician textiles of Carmona (Seville) in the Hispanic-Society Collection (New York). In A. Rast-Eicher & R. Windler (Eds.), *Archäologische Textilfunde—Archaeological textiles* (pp. 65–70). ArcheoTex.
- Almagro-Gorbea, M. (Dir.). (2008a). *La necrópolis de Medellín. I. La excavación y sus hallazgos*. Real Academia de la Historia.
- Almagro-Gorbea, M. (Dir.). (2008b). *La necrópolis de Medellín. III. Estudios analíticos. IV. Interpretación de la Necrópolis. V. El marco histórico de Medellín-Conisturgis*. Real Academia de la Historia.
- Almagro-Gorbea, M., López Rosendo, E., Mederos Martín, A., & Torres Ortiz, M. (2010). Los sarcófagos antropoides de la necrópolis de Cádiz. *Mainake*, 32(1), 357–394.
- Andersson Strand, E. (2009). Experimental textile archaeology. In E. Andersson Strand, M. Gleba, U. Mannering, C. Munkholt, & M. Ringgaard (Eds.), *North European symposium for archaeological textiles X* (pp. 1–3). Oxbow.
- Arruda, A. M. (2001). A Idade do Ferro Pós-Orientalizante no Baixo Alentejo. *Revista Portuguesa de Arqueologia*, 4(2), 207–292.
- Arruda, A. M. (2004). Necrópoles proto-históricas do sul de Portugal: o mundo oriental e orientalizante. In A. González Prats (Ed.), *El Mundo Funerario: Actas del III Seminario Internacional sobre Temas Fenicios* (pp. 457–494). Universidad de Alicante.
- Arruda, A. M., Covaneiro, J., & Cavaco, S. (2008). A Necrópole da Idade do Ferro do Convento da Graça, Tavira. *Xelb*, 8, 117–135.
- Arruda, A. M., Barbosa, R., Gomes, F. B., & Sousa, E. (2017). A necrópole da Vinha das Calças 4 (Beja). In J. Jiménez Ávila (Ed.), *Sidereum Ana III. El río Guadiana y Tartessos* (pp. 187–226). Consorcio Ciudad de Mérida.
- Arruda, A. M., Vilaça, R., & Gomes, F. B. (2022). Ornamentos de vestuario orientalizantes en Portugal: una panorámica de la situación actual. In R. Graells, P. Camacho, & A. Lorrio (coords), *Problemas de Cultura Material. Ornamentos y elementos del vestuario en el arco litoral mediterráneo-atlántico de la Península Ibérica durante la Edad Del Hierro (ss. X-V a.C.): Tendencias actuales de investigación* (pp. 83–118). Universidad de Alicante.
- Barros, P., Branco, G., Duarte, C., & Correia, J. (2005). A cista dos Gregórios (Silves). *Xelb*, 5, 41–52.
- Beirão, C. de M. (1986). *Une Civilisation Protohistorique du Sud du Portugal (Ier Âge du Fer)*. Éditions du Boccard.

- Belén Deamos, M. (2001). La cremación en las necrópolis tartésicas. In R. García Huerta & F. J. Morales Hervás (Eds.), *Arqueología funeraria: las necrópolis de incineración* (pp. 37–78). Universidad de Castilla-La Mancha.
- Campos, J., & Alvar, J. (Eds.). (2013). *Tarteso. El emporio del metal*. Almuzara.
- Cardoso, J. L., & Gradim, A. (2006). A Necrópole da Idade do Ferro de Cabeço da Vaca (Alcoutim). *Xelb*, 6, 203–226.
- Cardoso, J. L., & Gradim, A. (2008). O núcleo II da necrópole da Idade do Ferro de Cabeço de Vaca (Alcoutim). *Xelb*, 8, 103–115.
- Cerdeño Serrano, M. L. (1978). Los broches de cinturón peninsulares de tipo céltico. *Trabajos de Prehistoria*, 35, 279–307.
- Cerdeño Serrano, M. L. (1981). Los broches de cinturón tartésicos. *Huelva Arqueológica*, 5, 31–56.
- Correia, V. H. (1993). As necrópoles da Idade do Ferro do Sul de Portugal: arquitectura e rituais. *Trabalhos de Antropologia e Etnologia*, 33(3–4), 351–370.
- Demant, I. (2009). Principios para la reconstrucción de vestidos y textiles arqueológicos. In C. Alfaro Giner, M. Tellenbach, & R. Ferrero (Eds.), *Textiles y Museología. Aspectos sobre el estudio, análisis y exposición de los textiles antiguos y de los instrumentos textilia* (pp. 143–153). Universidad de Valencia.
- Demant, I. (2014). From stone to textile. The “Dama de Baza”. In C. Alfaro Giner, M. Tellenbach, & J. Ortiz García (Eds.), *Production and trade of textiles and dyes in the Roman empire and neighbouring regions* (pp. 21–25). University of Valencia.
- Deus, M., & Correia, J. (2005). Corte Margarida. Mais uma necrópole orientalizante no Baixo Alentejo. In S. Celestino Pérez & J. Jiménez Ávila (coords), *El Período Orientalizante* (pp. 615–618). CSIC.
- Dimova, B. (2018). Archaeological textiles in pre-Roman Thrace: State of the evidence. *Arachne*, 5, 24–35.
- Estebán López, C. (2014). Orientación de las tumbas y astronomía en la necrópolis de la Angorrilla. In Á. Fernández Flores, A. Rodríguez Azogue, M. Casado Ariza, & E. Prados Pérez (coords), *La necrópolis de época tartésica de La Angorrilla, Alcalá del Río, Sevilla* (pp. 639–644). University of Seville.
- Fernández Flores, Á., Rodríguez Azogue, A., Casado Ariza, M., & Prados Pérez, E. (coords). (2014). *La necrópolis de época tartésica de La Angorrilla, Alcalá del Río, Sevilla*. University of Seville.
- Fernández Flores, Á., Prados Pérez, E., & Rodríguez Azogue, A. (2014b). La intervención arqueológica. In Á. Fernández Flores, A. Rodríguez Azogue, M. Casado Ariza, & E. Prados Pérez (coords), *La necrópolis de época tartésica de La Angorrilla, Alcalá del Río, Sevilla* (pp. 59–84). University of Seville.
- Fernández Flores, Á., Prados Pérez, E., & Rodríguez Azogue, A. (2014c). El cementerio de época tartésica. Aspectos rituales. In Á. Fernández Flores, A. Rodríguez Azogue, M. Casado Ariza, & E. Prados Pérez (coords), *La necrópolis de época tartésica de La Angorrilla, Alcalá del Río, Sevilla* (pp. 251–320). University of Seville.
- Fernández Flores, Á., Prados Pérez, E., & Rodríguez Azogue, A. (2014d). Catálogo de sepulturas. In Á. Fernández Flores, A. Rodríguez Azogue, M. Casado Ariza, & E. Prados Pérez (coords), *La necrópolis de época tartésica de La Angorrilla, Alcalá del Río, Sevilla* (pp. 85–250). University of Seville.
- Ferrer Albelda, E. (2022). Textiles, vestimenta y adornos de indumentaria en Tarteso: una visión de conjunto. In R. Graells, P. Camacho, & A. Lorrio (coords), *Problemas de Cultura Material. Ornamentos y elementos del vestuario en el arco litoral mediterráneo-atlántico de la Península Ibérica durante la Edad Del Hierro (ss. X-V a.C.): Tendencias actuales de investigación* (pp. 147–156). Universidad de Alicante.
- Ferrer Albelda, E., & de la Bandera Romero, M. L. (2014a). Los broches de cinturón. In Á. Fernández Flores, A. Rodríguez Azogue, M. Casado Ariza, & E. Prados Pérez (coords), *La necrópolis de época tartésica de La Angorrilla, Alcalá del Río, Sevilla* (pp. 403–428). University of Seville.

- Ferrer Albelda, E., & de la Bandera Romero, M. L. (2014b) Las fíbulas. In Á. Fernández Flores, A. Rodríguez Azogue, M. Casado Ariza, & E. Prados Pérez (coords), *La necrópolis de época tartésica de La Angorrilla, Alcalá del Río, Sevilla* (pp. 393–402). University of Seville.
- Figueiredo, M., & Mataloto, R. (2017). Necrópoles rurais sidéricas do Baixo Alentejo setentrional: sociedade e mundo funerário nos Barros de Beja. In J. Jiménez Ávila (Ed.), *Sidereum Ana III. El río Guadiana y Tartessos* (pp. 353–398). Consorcio Ciudad de Mérida.
- Gillis, C., & Nosch, M. L. B. (2007). *First aid for the excavation of archaeological textiles*. Oxbow.
- Gleba, M. (2008). *Textile production in pre-Roman Italy*. Oxbow.
- Gleba, M. (2017). Tracing textile cultures of Italy and Greece in the early first millennium BC. *Antiquity*, 91(359), 1205–1222.
- Gleba, M. (2018). Textile cultures in Europe 1200–500 BC: A view from Greece. *Arachne*, 5, 14–23.
- Gleba, M., & Mannering, U. (2012). Introduction: Textile preservation, analysis and technology. In M. Gleba & U. Mannering (Eds.), *Textiles and textile production in Europe from prehistory to AD 400* (pp. 1–24). Oxbow.
- Gomes, F. B. (2014–2015). O mundo funerário da I Idade do Ferro no Sul do actual território português: notas para uma síntese. *Arqueologia & História*, 66–67, 47–62.
- Gomes, F. B. (2016). *Contactos culturais e discursos identitários na I Idade do Ferro do Sul de Portugal (séculos VIII-V a.n.e.): leituras a partir do registo funerário*. PhD Thesis presented to the University of Lisbon. Unpublished.
- Gomes, F. B. (2016–2017). A evolução dos rituais funerários da Idade do Ferro no Ocidente Peninsular: uma nova proposta de faseamento para a necrópole do Olival do Senhor dos Mártires (Alcácer do Sal). *O Arqueólogo Português*, 5(6/7), 15–57.
- Gomes, F. B. (2020). O conjunto vítreo da necrópole da I Idade do Ferro da Fonte Velha de Bensafrim (Lagos). *Ophiussa*, 4, 71–116.
- Gomes, F. B. (2021). A necrópole do Olival do Senhor dos Mártires (Alcácer do Sal, Portugal). In *Práticas funerárias, Cultura Material e Identidades na Idade do Ferro do Baixo Sado (séculos VII – II a.n.e.)*. UNIARQ.
- Graells, R., & Lorrio, A. (2017). *Problemas de cultura material: broches de cinturón decorados a molde de la Península Ibérica (s. VII-VI a.C.)*. Universidad de Alicante.
- Graells, R., Lorrio, A., & Camacho, P. (2018). *La colección de objetos protohistóricos de la Península Ibérica. I: Broches de cinturón, placas y fíbulas*. Römisch-Germanisches Zentralmuseum.
- Graells, R., Camacho, P., & Lorrio, A. (coords). (2022). *Problemas de Cultura Material. Ornamentos y elementos del vestuario en el arco litoral mediterráneo-atlántico de la Península Ibérica durante la Edad Del Hierro (ss. X-V a.C.): Tendencias actuales de investigación*. Universidad de Alicante.
- Grömer, K. (2010). *Prähistorische Textilkunst in Mitteleuropa – Geschichte des Handwerks und der Kleidung vor den Römern*. Naturhistorisches Museum Wien.
- Grömer, K., Kern, A., Reschreiter, H., & Rösel-Mautendorfer, H. (Eds.). (2013). *Textiles from Hallstatt. Weaving Culture in Bronze and Iron Age Salt Mines*. Archaeolingua.
- Jiménez Ávila, J. (2001). La necrópolis de «El Jardal» (Herrera del Duque, Badajoz). Elementos para el estudio del ritual funerario del suroeste peninsular a finales de la Iª Edad del Hierro. *Complutum*, 12, 113–122.
- Jiménez Ávila, J. (Ed.). (2017). *Sidereum Ana III. El río Guadiana y Tartessos*. Consorcio Ciudad de Mérida.
- López Ambite, F. (2008). Broches de cinturón. In: M. Almagro-Gorbea (Dir.), *La necrópolis de Medellín. II. Estudio de los hallazgos* (pp. 514–528). Real Academia de la Historia.
- López Flores, I. (2014). Estudio antropológico de la necrópolis de la Angorrilla. In Á. Fernández Flores, A. Rodríguez Azogue, M. Casado Ariza, & E. Prados Pérez (coords), *La necrópolis de época tartésica de La Angorrilla, Alcalá del Río, Sevilla* (pp. 557–604). University of Seville.
- Mannering, U., & Skals, I. (2014). Textiles and fabrics: Conservation and preservation. In C. Smith (Ed.), *Encyclopedia of global archaeology* (pp. 7282–7287). Springer.
- Marín-Aguilera, B., Rodríguez-González, E., Celestino, S., & Gleba, M. (2019). Dressing the sacrifice: Textiles, textile production and the sacrificial economy at Casas del Turuñuelo in fifth-century BC Iberia. *Antiquity*, 93(370), 933–953.



- Marzoli, D., & García-Teyssandier, E. (Eds.). (2019). *La necrópolis fenicia de Ayamonte (Huelva): memoria de la excavación del año 2013, estudios previos y complementarios*. Junta de Andalucía.
- Mataloto, R. (2010–2011). Os Senhores da Terra: necrópoles e comunidades rurais do território alto-alentejano nos séculos VI-V a.C. *Arqueologia & História*, 60–61, 77–100.
- Melo, L., & Silva, A. M. (2021). Enclosures of death in the early Iron Age. The necropolis of Esfola (Beja, Portugal). *Documenta Praehistorica*, 48, 2–12.
- Menéndez Menéndez, A., Sanabria Murillo, D., Sánchez Hidalgo, F., Gibello Bravo, V. M., & Jiménez Ávila, J. (2013). La necrópolis orientalizante de Valdelagrulla (Medellín, Badajoz). Datos preliminares. In J. Jiménez Ávila, M. Bustamante Álvarez, & M. García Cabezas (Eds.), *Actas del VI Encuentro de Arqueología del Suroeste Peninsular* (pp. 999–1030). Ayuntamiento de Villafranca de los Barros, Villafranca de los Barros.
- Peacock, E. E. (2001). The contribution of experimental archaeology to the research of ancient textiles. In P. Walton Rogers, L. Bender Jørgensen, & A. Rast-Eicher (Eds.), *The Roman textile industry and its influence* (pp. 181–192). Oxbow.
- Pereiro, T. do, Mataloto, R., & Borges, N. (2017). Alentejo, a Sul de Beja: a necrópole sidérica da Quinta do Estácio 6. In J. Jiménez Ávila (Ed.), *Sidereum Ana III. El río Guadiana y Tartessos* (pp. 303–332). Consorcio Ciudad de Mérida.
- Ponte, S. da (2006). *Corpus signorum das fíbulas proto-históricas e romanas de Portugal*. Caleidoscópio.
- Reverte Coma, J. M. (2008). Análisis antropológico y paleopatológico. In M. Almagro-Gorbea (Dir.), *La necrópolis de Medellín. III. Estudios analíticos. IV. Interpretación de la Necrópolis. V. El marco histórico de Medellín-Conisturgis* (pp. 795–832). Real Academia de la Historia.
- Ruiz Delgado, M. M. (1989). *Fíbulas Protohistóricas en el Sur de la península Ibérica*. University of Seville.
- Santos, F., Antunes, A. S., Grilo, C., Deus, M. de (2009) A necrópole da I Idade do Ferro de Palhais (Beringel, Beja). Resultados preliminares de uma intervenção de emergência no Baixo-Alentejo. In: *Actas del IV Encuentro de Arqueología del Suroeste Peninsular*. Universidad de Huelva, p 746–804.
- Santos, F., Antunes, A. S., Deus, M. de, & Grilo, C. (2017). A necrópole de Palhais (Beringel, Beja). In J. Jiménez Ávila (Ed.), *Sidereum Ana III. El río Guadiana y Tartessos* (pp. 227–262). Consorcio Ciudad de Mérida.
- Soares, R. M., Baptista, L., Pinheiro, R., Oliveira, L., Rodrigues, Z., & Vale, N. (2017). A necrópole da I Idade do Ferro do Monte do Bolor 1-2 (São Brissos, Beja). In J. Jiménez Ávila (Ed.), *Sidereum Ana III. El río Guadiana y Tartessos* (pp. 263–302). Consorcio Ciudad de Mérida.
- Storch de Gracia, J. J. (1989). *La fíbula en la Hispania antigua: Fíbulas protohistóricas del suroeste peninsular*. PhD Thesis presented to the Complutense University of Madrid. Unpublished.
- Torres Ortiz, M. (1999). *Sociedad y Mundo Funerário en Tartessos*. Real Academia de la Historia.
- Torres Ortiz, M. (2004). Las necrópolis tartéssicas. In A. González Prats (Ed.), *El mundo funerario. Actas del III Seminario Internacional sobre Temas Fenicios* (pp. 425–255). Universidad de Alicante.
- Torres Ortiz, M. (2008). Fíbulas. In M. Almagro-Gorbea (Dir.), *La necrópolis de Medellín. II. Estudio de los hallazgos* (pp. 529–535). Real Academia de la Historia.
- Torres Ortiz, M. (2017). El paisaje funerario de las necrópolis tartéssicas. In S. Adroit & R. Graells (Eds.), *Arquitecturas funerarias y memoria: la gestión de las necrópolis en Europa occidental (ss. X-III a.C.)* (pp. 359–398). Osanna Edizioni.
- Valério, P., Araújo, M. F., Soares, A. M. M., Alves, L. C., Soares, R. M., Melo, L., & Baptista, L. (2021). Early Iron Age copper-based funerary items from southern Portugal. *Archaeological and Anthropological Sciences*, 13, 114.

**Francisco B. Gomes** trained as an archaeologist and is currently a Postdoctoral Researcher at UNIARQ and the School of Arts and Humanities of the University of Lisbon. His research focuses on the Late Bronze and Iron Ages of southern Iberia. He is a member of the COST Action *EuroWeb*.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



**Part V**  
**Tools for the In Situ Analysis of Funerary**  
**Textiles**

# Chapter 13

## Protocol for the Excavation, Care, and In Situ Analysis of Funerary Textiles in Arid Contexts: Perspectives from Ancient Sudan and Egypt



Elsa Yvanez and Valentina Turina

**Abstract** The discovery of textiles on archaeological excavations is rare and, for this reason, tends to be a little bit of a surprise for the archaeologists, who do not always feel prepared to handle this type of organic material. The situation is further complicated when textiles are found in very close connection to human remains. The complexity of such assemblages, fragile and in diverse states of preservation and decomposition, can be overwhelming. Each type of material requires a different study protocol, follows a different approach, and involves different specialists, whose priorities might not always align. However, in specific kinds of environment, cases of well-preserved body wrappings are relatively frequent and it is a good idea to establish a work model that fits the goals of archaeologists, anthropologists, and the different material specialists. A group of diverse experts has elaborated the present protocol for the in situ analysis of funerary textiles with this goal in mind, and we hope it can serve as a useful guide for different field practitioners. Since textiles and other organic materials are preserved according to very different principles depending on the local climatic conditions, we chose to focus this protocol on a particular group: desiccated remains from arid regions. As examples, we have selected two naturally mummified bodies found in Sudanese Nubia, on Sai Island, dated to the Meroitic period (c. 100-200 CE). The protocol comprised models of workflow from the discovery to the post-excavation phase and detailed descriptions

---

**With editorial committee** Joanna Ciesielska, Alistair Dickey, Francisco F. Gomes, Malgorzata Grupa, Dawid Grupa, Iwona Kozieradzka-Ogunmakin, Sanna Lipkin, Robert Mahler, Christina Margariti, Luise Ørsted Brandt, Malgorzata Siennicka, Robert Stark, Sabrina Tatz, Laura Viñas Caron, Magdalena M. Wozniak, and Piotr Zakrzewski.

---

E. Yvanez (✉)  
Centre for Textile Research, Saxo Institute, School of Archaeology,  
University of Copenhagen, Copenhagen, Denmark  
e-mail: [elsa.yvanez@hum.ku.dk](mailto:elsa.yvanez@hum.ku.dk)

V. Turina  
Museo Egizio, Turin, Italy

of different recording methods, as well as a practical guide for the storage of textiles in an excavation setting.

**Keywords** Guide · Best practices · Excavation · Human remains · Textiles · Egypt & Sudan

### **13.1 Introduction: Multi-disciplinary Approaches to Wrapped Human Remains—A Project-Based Collaboration**

A pile of bones neatly arranged on a labelled tray; a small cardboard container often reused from the archaeologists' meal and filled with mixed textile fragments; notes, photographs, drawings and archives... That is what is often left from the excavation of human remains in the Nile valley. In Egypt and Sudan, as in other arid regions, the dry and hot climate has led to the preservation of thousands of ancient textiles in burials. Despite the absence of embalming practices, as seen in Pharaonic Egypt, the populations of ancient Sudan and Nubia showed a marked interest in the concealment of the dead body in layers of textiles, animal skins, and/or basketry mats. These organic remains are found remarkably well preserved around naturally mummified bodies, or in a more fragmentary state with undisturbed or disturbed skeletal remains. However, they have seldom received dedicated attention from archaeologists and anthropologists, whose primary interests reside in the human body and the material environment of the grave. As a result, our knowledge concerning wrapped human remains has often been fragmented across different reports written by different specialists, called to study the material at different stages of the excavation and post-excavation process. However, current research led by specialists at funerary sites of different periods in Sudan, are now changing this status quo, demonstrating a growing interest in a more holistic approach to burial practices.

This protocol hopes to participate in this change, offering a methodology for an integrative textile archaeology in funerary contexts. The aim of the protocol is to offer an easy-to-follow guide for the excavation, analysis, and preventive conservation of funerary textiles, from *in situ* findings to advanced testing in laboratories. Based on Sudanese material and case studies, this methodological framework can find applications in Egypt, the Mediterranean basin, the Near East, and other arid regions of the globe.

Accustomed to working in Sudan in sometimes isolated geographical locations, the authors are fully aware of the limitations imposed by excavation settings. We acknowledge the logistic difficulties created by limited storage facilities and quasi-impossible access to conservation equipment. We also recognize the financial difficulty of hiring a full-time conservator in excavation teams already subjected to strict budget constraints. Based on museum-based best practices, existing conservation guidelines for the storage of archaeological textiles can often seem unattainable when confronted with the realities of fieldwork, and this disciplinary divide can lead to miscommunication between conservators and archaeologists.

With this protocol, we hope to build a bridge between these two spheres and provide useful tools for archaeologists, anthropologists, and textile specialists to:

- enhance our archaeological practices in the field;
- improve our chances for optimal conservation of excavated artefacts;
- gain a holistic view of textile usage in the burial assemblage and funerary process;
- preserve and study textiles to recover data that informs wider socio-economic aspects of past societies, e.g. dress practices, agricultural and pastoral resources, craft production, exchange, etc.

### 13.1.1 *Genesis and Development of the Project*

The different steps of the protocol were discussed during an interdisciplinary workshop held at the University of Warsaw, Polish Center of Mediterranean Archaeology, and online, on 15–16th April 2021. Under the auspices of the *Unravelling Nubian Funerary Practices* project<sup>1</sup> and the EuroWeb COST action,<sup>2</sup> the workshop brought together archaeologists, textile specialists, physical anthropologists, and conservators working in the Nile Valley, the Mediterranean basin, and continental Europe.<sup>3</sup> Two following meetings in May and September 2021, as well as comments from different colleagues, cemented the present consortium of authors. The protocol was tested in the field in autumn 2022, during a study season conducted by Elsa Yvanez on Sai Island, as part of the Sai Island Archaeological Mission (SIAM),<sup>4</sup> and by Magdalena Wozniak at the site of Old Dongola, as part of the UMMA<sup>5</sup> mission.

<sup>1</sup>This project was conducted by Elsa Yvanez at the Polish Center of Mediterranean Archaeology, University of Warsaw, between 2021 and 2022. It was funded by the NAWA Polish National Agency for Academic Exchange, Ulam programme PPN/ULM/2020/1/00246. More information is available at <https://pcma.uw.edu.pl/en/2023/02/20/project-yvanez/> (consulted 09-04-2023).

<sup>2</sup>This collaborative project brings together the growing community of European textile researchers, aiming to cement this academic field within and beyond European borders (funded by the EU as COST Action 19,131). More information available at <https://euroweb.uw.edu.pl/> (consulted 09-04-2023).

<sup>3</sup>The many discussions generated by this event could have led to the creation of a wider protocol covering other regions than the Nile Valley. However, they also highlighted the necessity to design a study strategy that is sensitive to the specificities of each archaeological site and milieu. The present authors thought it better to focus this protocol on material and site experiences they could directly relate to, in order to be able to give more practical advice. Other examples and approaches can be gathered through case studies published in the ever-growing literature on archaeological textiles, including in the present volume.

<sup>4</sup>Directed by Vincent Francigny (Centre National de Recherche Scientifique, France) and placed under the auspices of the National Corporation for Antiquities and Museum (NCAM—Sudan).

<sup>5</sup>Directed by Artur Obluski, Polish Center of Mediterranean Archaeology, University of Warsaw, as part of the project UMMA—Urban Metamorphosis of the community of a Medieval African capital city (ERC StG 759926), under the auspices of the NCAM.



Further steps in the conceptualisation and writing of the present chapter occurred the following year as part of the *Fashioning Sudan* project.<sup>6</sup>

### 13.1.2 *Multi-disciplinary Approaches*

This project rests on an interdisciplinary approach that merges methods from biological anthropology, textiles studies, and funerary archaeology. Biological anthropology can reconstruct the original position of the body, identify the age and sex of the deceased, and specify the impact of thanatological processes on the remains. The development of this field has provided us with a complex theoretical framework and clear directions for an inclusive approach to human remains in the field (Duday et al., 1990; Duday, 2009). Its main components are the reconstruction of the body's original position and the understanding of funerary gestures. In that respect, the layout of shrouds and positioning of clothing items are of paramount importance, and justify a close collaboration between different experts. Textiles studies can, in turn, help us identify the number of fabrics used in the grave, their nature, and their location on the remains (Andersson Strand et al., 2010). Detailed analyses show if body wrappings were made of specially woven pieces or reused items, and how they were combined. Funerary archaeology describes the environment of the grave (its content and structure), and relates it to the rest of the cemetery and to our current knowledge of funerary beliefs. Taken together, these methods can lead to a dynamic study of burials, able to recognize and interpret preparatory treatments of the body, sepulchral practices and post-sepulchral events. Anchored in Duday's "archéologie de terrain" bio-anthropological school, such an approach has been developed in France, especially on ancient and medieval burials with low numbers or no textile preserved, excavated in France (Bonnabel & Carré, 1996; Bizot & Signoli, 2009). It has however stayed rather confidential outside of this academic sphere. One exception in Sudanese archaeology is the study of an early medieval burial from Sai Island, which reconstructs the funerary gestures merging textile and osteological evidence (Peressinotto et al., 2001). Still, these various attempts focused more on anthropological remains and rarely included detailed textile analysis. While one scholar can weave these different threads of evidence together, building such a holistic analysis requires the detailed collection of specialized data and benefits from the collaboration of different experts. We hope that the present protocol, its authors, and the editorial committee can constitute a valuable resource to inspire more cooperation in the field and beyond.

---

<sup>6</sup>Directed by Elsa Yvanez at the Centre for Textile Research, University of Copenhagen. *Fashioning Sudan. Archaeology of dress along the Middle Nile* (ERC StG 101039416, 2022-2027), open access funded by Fashioning Sudan.

### 13.1.3 *Presentation of the Case Studies and Organisation of the Present Chapter*

To guide the reader through the different steps of the protocol, documentation methods, and storage guidelines, the authors have sought to provide a richly illustrated chapter. For this reason, throughout the following descriptions, we will be following the study of two cases of wrapped human remains from Sai Island. The two inhumations were unearthed in the Meroitic cemetery 8-B-52.B, dated to c. 100–200 CE. They were both found in their respective tomb chambers, in disturbed contexts resulting from the reopening of the graves for additional inhumation(s) and/or plundering of the grave goods. The cavities were dug at the end of a sloping access ramp and placed under a now-disappeared mudbrick pyramid. The human remains are naturally mummified, in anatomical connection, with a good preservation of the bones, skin, and internal tissues, as well as *in situ* textiles. Since their discovery in 2018 and 2019 respectively, the study of these two individuals is still ongoing, delayed as it has been by the Covid epidemic and the 2021 political events in Sudan. The present author conducted the textile study in November 2022, for 10 days, in the anthropological study room where the remains are stored, inside the Sai excavation house. Fieldwork and subsequent discussions were done in collaboration with Vincent Francigny, director of the mission, Loïc Bouffard, archaeologist and topographer, and Tosha Dupras and Yann Ardagna, physical anthropologists.<sup>7</sup>

#### 13.1.3.1 Tomb 19—Individual 5 (Fig. 13.1)

In 2018, this adult individual was found in an extended prone position on the right-hand side of the burial chamber, on a layer of loose sediment.<sup>8</sup> The position of the skeleton, especially of the skull, shows that the body was originally placed on its back: early decomposition of the labile joints in the cervical region and a downward slippage of the skin over the left parietal bone indicate that the head started to twist to the left, a movement frequently observed in extended supine inhumations. It is probable that, sometime after the funeral, the grave was reopened and the body moved—effectively flipped onto its stomach—to one side of the cavity.<sup>9</sup> The rigidity of the remains and the wall-effect indicated by the parallel long bones show that the body was then already well desiccated and probably maintained within a tight envelope. Due to the narrow cavity, little documentation could be carried out in the

---

<sup>7</sup>We would like to thank the whole SIAM team with the utmost gratitude, for generously sharing their time, expertise, and documentation. This project could not have been implemented at all but for their constant support, especially that of Vincent Francigny.

<sup>8</sup>Excavation and initial recording of the tomb: Fakhri Hassan Abdallah, 20–27 Nov. 2018.

<sup>9</sup>As it is often the case in Meroitic inhumations, T019 is a multiple burial that contained, in total, the remains of five individuals—three adults, one juvenile, and one unknown—placed in the grave and subsequently manipulated at different times (unpublished anthropological report, Tosha Dupras & Yann Ardagna).



**Fig. 13.1** View of tomb T019, with individual 5 *in situ* in the cavity. (Image Sai Island Archaeological Mission)

field, and it was decided to lift the remains and to store them whole to await their detailed study. The body was placed in the same prone position in a large wooden box, on a bed of sand.

Archaeologists noted the presence of relatively well-preserved textile remains around the pelvic region, and photographs were shared with the present author. Since the skin and the wrappings were left in place on the body, it was impossible to distinguish possible diagnostic traits such as age and sex.<sup>10</sup>

### 13.1.3.2 Tomb 53—Individual 1 (Fig. 13.2)

In 2019, this individual was found in an extended supine position, laying on a thin layer of sand in the centre of the burial chamber, head closest to the entrance.<sup>11</sup> The body is naturally mummified, but several areas were more heavily degraded than others, notably in the lower thoracic and lumbar region. This led to the dislocation of the remains and its lifting in two separate parts, the head and torso, and the lower limbs. The body shows clear signs of hyper-contraction of the upper torso area, with an upward lifting of the shoulder articulation and the verticalization of the clavicle slightly visible on the body's right side. It indicates tight confinement in a shroud—preserved on the remains—and possibly its placement in a narrow coffin. The presence of such a burial container is also attested by the presence of wood fragments, still attached in a heavily degraded state to some of the textile remains.

<sup>10</sup>The detailed anthropological study has been indefinitely suspended until the mission can resume its work on Sai, awaiting the cessation of the conflict that is presently afflicting Sudan.

<sup>11</sup>Excavation and initial recording of the tomb: Zerroug and Marie-Paul Jung, 07–10 Nov. 2019.

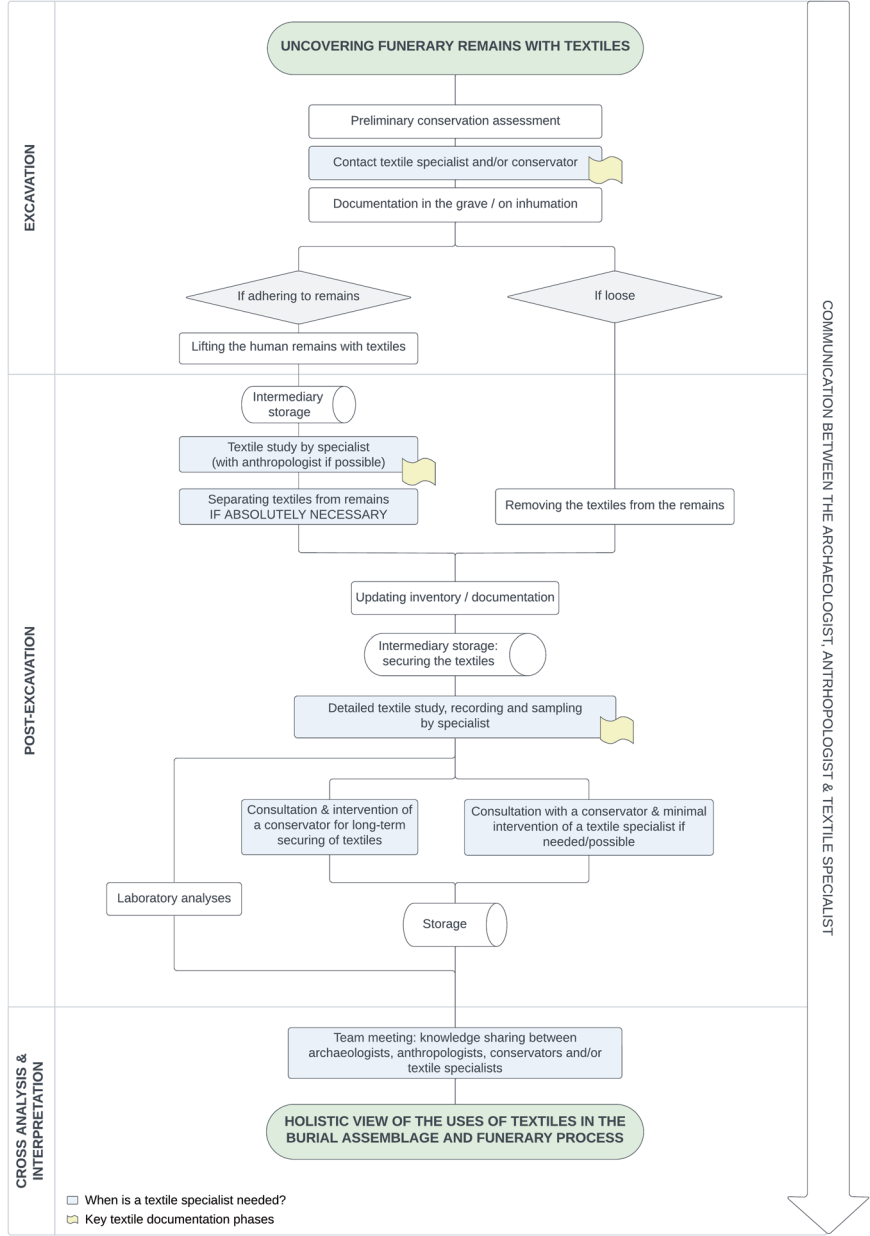


**Fig. 13.2** View of tomb T053 with individual 1 *in situ* in the cavity. (Image Sai Island Archaeological Mission)

Because of the overall degradation of the burial, with many textile and skeleton parts coming loose, a photogrammetry model was created from a set of photographs taken right after the body was recovered from the cavity and laid on a board, before its transfer to the excavation house. It was then stored in different trays, keeping the textiles *in situ* when possible, and organised according to their positioning on the body. Preliminary observations indicate that the individual might have been of adolescent age. This collaboration between archaeologists, a textile specialist, and anthropologists has led to many questions along the way, as well as mistakes and good ideas. It is to try to answer these questions and share our experience that we chose to divide this chapter into three parts: (1) a step-by-step guide for *in situ* textile studies, including many steps that archaeologists can take before, during, and after excavation; (2) an illustrated account of different documenting methods, as carried out during the study of the two inhumations from Sai Island; and (3) practical storage guidelines that allow for the preventive and long-term conservation of textile finds.

## 13.2 A Step-by-Step Guide for *In Situ* Textile Studies

This guide presents the succession of steps that can be taken to safeguard as much information as possible from the discovery of wrapped human remains (Fig. 13.3). It is very much a process, which leads from one stage to the next after careful examination of the assemblage and thoughtful answering of key questions. The process in itself can be modelled in a diagram, but we must remember that each case is very much unique. The succession of these different steps seems to the present



**Fig. 13.3** Workflow for the integration of *in situ* textile analysis on naturally mummified human remains. (Image Elsa Yvanez)

authors and editorial committee the best way to ensure proper documentation at every stage, but for each of them, field practitioners can choose between an array of different solutions and methods, depending on their team's expertise, schedule, funds, material availability, and research questions.

### 13.2.1 Before Excavation

Archaeologists working in arid environments tend to expect to find well-preserved organic materials, but are not always prepared to face the practicalities of their manipulation and study. In truth, despite the relative uniformity of climatic conditions in northern Sudan and Nubia, the state of conservation of wood, textiles, and animal skin vary greatly depending on local conditions. Water infiltration, high salinity levels, the action of termites, and the frequency of grave reopenings are all factors that heavily affect the preservation of textiles. When they are preserved, however, textiles tend to be found in high numbers, reflecting their important use for both clothing and funerary practices. After a few seasons, they can represent a very large body of material that is often very hard to tackle for anyone joining the team at a later stage. Therefore, it is always good to be adequately prepared.

For textiles in particular, this includes:

- Familiarizing oneself with the basics of textile conservation and first aid practices;
- Packing a few essentials to take to the field (e.g. light packing material, see below);
- Having a textile specialist on call. If textiles are frequent discoveries at a given site, it is a good idea to ask a textile researcher to join the team.

Useful resources to bring to excavation:

- the small booklet: Gillis, C and Nosch, M-L (eds) (2007) *First Aid for the Excavation of Archaeological Textiles. Ancient Textiles Series 2*. Oxford: Left Coast Press.
- this practical guide!

Textile archaeology is a rapidly growing field of research in European institutions and over the globe. Several professional networks can provide a good point of departure to find relevant experts. At the time of publication, you can, for example, inquire at:

- The Textiles from the Nile Valley research group, operating from the Katoen Natie HeadquARTers in Antwerp (Belgium)<sup>12</sup>;
- The Textile Archaeology in Egypt and Sudan network, operating from the Centre for Textile Research at the University of Copenhagen (Denmark)<sup>13</sup>;

<sup>12</sup> <https://www.headquarters-katoennatie.com/en/textiles-from-the-nile-valley> (consulted 24-03-2023).

<sup>13</sup> <https://ctr.hum.ku.dk/research-programmes-and-projects/ctr-networks/textile-archaeology-in-egypt-and-sudan/> (consulted 24-03-2023).



- The EuroWeb COST action, operating from the University of Warsaw (Poland), which collects together 200+ textile specialists from all over Europe and affiliated countries.<sup>14</sup>

Many museums, conservation centres, and universities also house textile experts who will be happy to advise archaeologists, before and during fieldwork.

## 13.2.2 *During Excavation*

### 13.2.2.1 *Upon Discovery*

The discovery of funerary textiles can take different forms. A frequent example would be scattered fragments found jumbled with disturbed bones or “floating” in the fill of the cavity’s access ramp. In this situation, not much burial-related information can be retrieved from the context and efforts need to be focused on proper handling and storage, before considering a general textile study. At the opposite end of the spectrum, textiles can also be found well preserved when an inhumation was left undisturbed by ancient manipulation and more recent robbing. This is especially true in the case of naturally mummified bodies (see Figs. 13.1 and 13.2). Here, it is particularly crucial to properly record textiles *in situ* on the body.

Upon discovery of textiles in contact with human remains, the first step is to take a pause—to interrupt the nitty-gritty work of excavating and uncovering to gather necessary information. This may seem trivial but is often overlooked, as archaeologists tend to work under pressing time constraints. It does not have to be a long pause, just enough time to ensure that proper steps can be taken to guarantee the optimal documentation of a very fragile arrangement and the onward preservation of the material.

#### 13.2.2.1.1 Preliminary Condition Assessment

At this stage, it is important to assess the condition of the textile(s) (Fig. 13.4). As mentioned above, this state of preservation can change from grave to grave, and even vary within a single grave depending on the location of the textiles on the body. For example, textiles found along the legs and the skull tend to be better preserved than the ones placed around the stomach and loins, which suffer more because of their immediate proximity to decomposition fluids.

Try to answer questions such as:

- Are textiles preserved *in situ* in connection to human remains? How disturbed is the inhumation?
- Are textiles loose or attached to the bones/the body?

---

<sup>14</sup><https://euroweb.uw.edu.pl/> (consulted 24-03-2023).



**Fig. 13.4** Different types of conservation on Meroitic cotton textiles. Clockwise from the top left corner: desiccated textile fragments from a fringed fabric, fairly well preserved, from Sai Island (8-B-52.B, T11-41), with adhering skin. (Image E. Yvanez / Sai Island Archaeological Mission); well preserved pliable tapestry fragments, carbonized agglomerated textiles, and very fragmented and desiccated fragments from Meroe, tomb W308. (Image E. Yvanez, courtesy of the Sudan National Museum)

- Are the textiles structurally sound?
- Is the textile one more-or-less flexible layer or is it agglomerated in a powdery or compacted mass?
- Are small fragments falling apart to the touch?
- Are textile imprints visible on preserved skin?
- Could decayed textiles be still visible through soil coloration?

The results of this assessment will guide all future intervention on the textile material, especially regarding the separating of the textiles from the human remains and the chosen storage solution (see below).

It is crucial to understand that archaeological textiles are more secure buried in the tomb where they have survived hundreds of years than they will be outside of it, subjected to oxygen, varying humidity levels, bacterial and fungal parasites, and general contaminants. Sadly, the worst enemy of archaeological textiles is often human factors, however well intended the intervention. As soon as a textile is exposed, important physical and chemical reactions continue to affect its structure, from the macro-structure of the weave down to the molecular level. In Sudan and

Nubia, the ambient aridity leads textiles to become increasingly desiccated or even carbonized, which results in a significant loss of fibres and a very brittle fabric prone to breakage.

### 13.2.2.1.2 Consult a Textile Specialist—Form a Multi-disciplinary Team

From there, it is a good idea to consult a textile specialist or to follow the protocol you previously established with your team's textile expert. If no one is present on site at the time of excavation, sharing photographs of the textiles *in situ* on the remains can be the start of a useful consultation. Together, archaeologist, biological anthropologist, and textile specialist can decide on the right path of action, based on their research questions and accommodating the practicalities of the mission.

Important points to discuss must include:

- The accessibility of the remains in the grave. What can we see and how?
- Should the textiles be separated from the remains? If so, at what stage of the research?
- After *in situ* documentation, how are we practically going to retrieve and transport the material?
- How should we store it?

The answers to these questions have important logistic limitations, such as the way material is stored and accessed in the dig house, the amount of space available, the nature of storage containers available, and the presence or absence of relevant specialists at the time of discovery. These have to be accommodated to the best of the local possibilities. However, it is also necessary to think about more conceptual matters and adopt best practices for: (i) the ethical handling and study of human remains; and (ii) the long-term preservation of the material, free of potential contaminants and safe from degradation agents.

### 13.2.2.2 First Documentation *In Situ*

Armed with a good plan of action, the archaeologist and/or textile specialist can conduct a first documentation of the textiles *in situ* on the burial (Fig. 13.5). This step is fundamental, as it guarantees the proper traceability of the textile material to the original burial deposit and—therefore—permits the accurate reconstruction of the wrapping gestures and other funerary rites. The extent to which this documentation can be carried out directly inside the grave or right outside of it if the body is removed depends on the accessibility of the remains; sometimes, the tomb cavity is so narrow it is impossible for the archaeologist to access the totality of the body, let alone utilize recording equipment. Other times, the body is obscured by decayed wood, other inhumations, or jumbled debris, making the detecting and cleaning of very fragile materials rather tricky indeed. Another difficulty, prosaic but unavoidable, is the wind, which can blow very strongly in the open landscape of Sudan, and

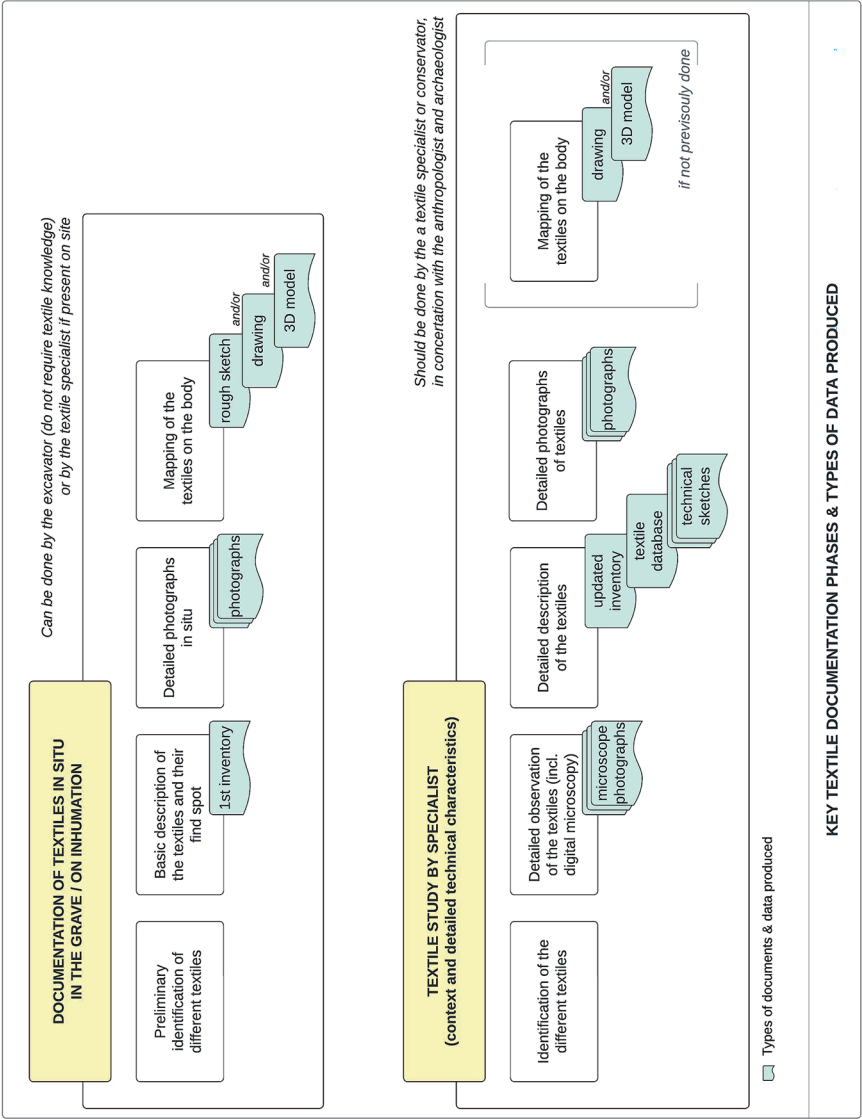


Fig. 13.5 Two phases of textile documentation: methods and types of data produced. (Image Elsa Yvanez)

easily blow away light textiles when the remains are exposed. The shortest delay between discovery and documentation is therefore always advisable.

This first documentation step needs to be tailored to every situation and can include some or all of the following strategies:

- Preliminary assessment of the number of different fabrics;
- Mapping the textiles on the body;
- Photographs, including of detailed areas;
- Basic description of the burial and inventory of the different artefacts.

Each of these steps can be conducted using different methods (see below), to be chosen depending on the time, skills, and material available at the time of discovery.

### A Note on Numbering

At this stage, before any step is taken to move the remains, it is important to give the textile(s) inventory number(s). In the past, many textile wrappings have been considered part of the human body and—just as the bodies generally do not receive an artefact number—they were not registered as an artefact in the inventory. This practice has contributed to the slow masking of the presence of textiles in graves, as they disappeared from the finds list.

Giving an artefact number to a textile after its first documentation in the field is, however, not easy. Only careful analysis by a textile specialist can securely distinguish different textiles from each other, and it must be expected that all preliminary observations conducted in the field will be revised later. In consequence, if differentiation between fabrics cannot be easily done at this stage, it seems advisable to give a unique number to all the wrappings. If the wrappings are fragmentary and located on different parts of the body, one number can be given to the textiles from each area. The notation, on the storage container and database entry, must always include the number of the tomb and of the individual, if known. During the textile study, if different fabrics are identified, the numbering can be adapted (e.g. adding different letters for each, A, B, etc.) or a new number can be attributed to the newly identified piece(s).

Examples of numbering and labelling:

Tomb n#	Individual n#	Artefact inventory n#	Textile n#	Name
<i>At the time of excavation</i>				
Tomb 4	Ind. 1	004-06		Textile wrappings
<i>After textile study</i>				
Tomb 4	Ind. 1	004-06	004-06.A	Textile wrappings, fabric A.
			004-06.B	Textile wrappings, fabric B.
			004-06.C	Textile wrappings, fabric C.

### 13.2.2.3 Keeping Textiles and Remains Together

Local conditions often dictate that the remains should be lifted quite rapidly from the tomb's cavity and brought to the dig house, where anthropologists will study them in detail. Ideally, this study takes place shortly after excavation, but in practice,

many skeletons wait for several years before anthropologists have time to reach them. Therefore, the archaeologist or anthropologist in charge of the excavation must decide promptly on how to retrieve the remains and how to store them so no evidence is compromised. Once again, this step is entirely dependent on the preservation of the remains.

### **If the Remains are Skeletonized and/or Disturbed**

In this case, the textiles will most often be loose around the bones and prone to fall during manipulation. It is therefore of paramount importance to proceed to thorough documentation *in situ*—before lifting the remains. In order to retain as much information as possible, it is best to keep the textiles together with the bones they were associated with until specialists can conduct the full textile and anthropological study (Fig. 13.6). Detailed pictures and notes taken during excavation would palliate any change in the condition and position of the textiles.

Sometimes, textiles can adhere rather well to portions of the skeleton, either because the fabric was solidly knotted or because this part of the burial became agglomerated in sediments. Here, it is very helpful to lift this portion of the body as a “block”, so the micro-stratigraphy of textile layers and bones can be safely analysed in the study room or lab.

**Fig. 13.6** Upper part of the body of individual 1 (T053) stored in wooden tray lined with Tyvek®, with textiles left in situ on and around the remains. (Image Elsa Yvanez/Sai Island Archaeological Mission)







**Fig. 13.7** Body of individual 5 (T019) stored in a wooden box on a bed of sand, with textiles left in situ on the remains. (Image Elsa Yvanez/Sai Island Archaeological Mission)

### **If the Remains are Naturally Mummified**

In this case, it is best to remove the body from its cavity as a whole, as complete as possible, and to keep it as such (Fig. 13.7). A formidable quantity of bio-anthropological information can be gathered through the study of naturally mummified bodies, and their analysis must be entrusted to forensic experts. As a rule, it is therefore better to disturb the remains very little. Where the textiles are concerned, it enables the textile specialist to conduct their study directly on the remains, in the protected environment of the excavation study room or lab, and taking as much time as necessary. This solution has the added advantage of allowing for full documentation of the “body bundle”—body and textiles—as it was found in the grave, without the constraints of fieldwork in the post-excavation stage.

### **Separating the Textiles?**

In certain situations, anthropologists might later wish to remove the wrappings from the bodies. Such an invasive step needs to be thoroughly discussed within the team, and the pros and cons weighed in the light of scientific and ethical debates. This protocol is not the place to comment upon such issues, which continue to be constantly renegotiated within the academic world. It is also important to note that modern analytical methods, such as CT scanning, are rarely accessible to archaeologists working in the field. Today, it is, for example, not available to archaeologists in Sudan, where we must adapt our approach and methods to the limited infrastructure. Within the framework of this protocol, it suffices to say that, when possible, a passive conservation approach would be preferred, to preserve as much of the burial assemblage as possible for future generations to study. That said, the removal of textiles—in their entirety or only partially, for natural reasons or because of scientifically related manipulations—do sometimes occur. This can present certain advantages for the study of textiles, as the whole artefact then becomes accessible. The pros and cons of such a decision are characterized by considerations of varying nature, oscillating between purely logistic aspects and ethical standpoints.

	Keeping the textiles on the remains	Removing the textiles from the remains
Pros	<p>Preserve the integrity of the human remains.</p> <p>Respect the arrangements of the funerary rites.</p> <p>Funerary textile gestures can be fully documented and reconstructed.</p> <p>Offer more opportunities for future studies.</p>	<p>The textiles can be accessed in their entirety.</p> <p>Can be “stretched” to gain a full view of their original shape/features.</p> <p>Reveal the whole body to conduct thorough anthropological analyses.</p> <p>Easier to pack, move around, and store.</p>
Cons	<p>Hide certain diagnostic parts of the skeleton.</p> <p>More difficult to stabilize and protect for long-term storage.</p> <p>Difficult to provide suitable containers.</p> <p>Takes a lot of space to store.</p>	<p>The original arrangement of the textiles on the dead body is irremediably lost.</p> <p>The body is thoroughly exposed and modified (discuss ethical implications).</p>

It is also important to note that the *in situ* preservation of textiles on a body is never total and is often a question of degree: some parts of the body might be very well preserved with textiles firmly adhering to them, others might be much deteriorated. The same applies to the assemblage of human remains from a single tomb or from a whole cemetery. There is not much sense in devising a one-size-fits-all solution; the strategy adopted for each set of remains will differ from case to case. The advantages of building an interdisciplinary team and study protocol is essential to balance research priorities.

If the textiles are loose and cannot be lifted together with the remains, or if the decision is taken to remove the textiles from the body, it is very important to keep them as closely related to each other as possible. This can be achieved through a detailed recording and inventorying, and through their shared storage until a complete textile and anthropological study can be carried out.

### 13.2.2.4 Handling and Intermediary Storage

Storage-related questions might seem to be rather trivial, but they are in fact of paramount importance during excavation and have a direct impact on the long-term preservation of the material. In a region where plastic bags deteriorate very quickly, where buildings are not waterproof and yet are subjected to rare but devastating rains, and where pests such as termites and mice are frequent uninvited guests, providing efficient conservation-grade storage is extremely difficult and costly. Far from museum facilities, the realities of the field need to be fully taken into account when devising research plans and storage strategies. For a complete state-of-the-art guide to preventive textile conservation, see Part 3 of this protocol.

On the one hand, if the body is lifted as a whole from the field together with its wrapping, in the absence of proper conservation-grade storage materials, it is best to store it in a large box on a bed of sand, or on a board, protected from major contaminants but not sealed in an airtight container (cf. Figs. 13.6 and 13.7). A particularly delicate step is the lifting and transport of the body, which, depending on its state of preservation, can easily become dislocated in the process (Fig. 13.8).



**Fig. 13.8** *In situ* examination of the upper part of individual 1 (T053), after its extraction from the tomb cavity and partial dislocation. Team members portrayed, from left to right: archaeologist Vincent Francigny, anthropologist Tosha Dupras, Gabrielle Brugnacchi, and archaeologist-topograph Loïc Bouffard. (Image Sai Island Archaeological Mission)

The juncture between thorax and pelvis is especially fragile. Once outside of the burial cavity, the body is also exposed to the wind, which can frequently be strong enough to disturb the positioning of textiles (if not completely blow them away!). To palliate these issues, a large sheet of woven polyethylene, such as Tyvek®, can be used to wrap the remains when placed on the board, to secure them thus. On the other hand, when textiles are recovered as loose pieces, the chosen storage solution needs to take into account—first and foremost—the condition of the fabric.

#### 13.2.2.4.1 Loose Textiles—General Principles for Storing and Handling

Textiles must always be stored flat without alteration to their preserved shape, folds, and volume. This is naturally easier to implement with smaller textile pieces or fragments, but becomes difficult with very large items such as fully preserved shrouds. Specific steps can be taken in this case (see below, *Practical Storage Solutions*). To prevent crushing, they must not be piled on top of each other, as with growing desiccation and weight, the fragments placed on the bottom will invariably be crushed. For a similar reason, placing them in between sheets of glass is not recommended. The use of plastic find bags, readily available at archaeological excavation, should be limited as much as possible: textiles deteriorate very quickly through the repeated



**Fig. 13.9** Upper part of the textile garment found on individual 5 (T019), at different stages through the workflow: (a) recovered from the human remains and placed on a shaped support; (b) flattened and placed on its storage board; (c) board enclosed in a labelled envelope. The board is made of wood (far from ideal but only material available locally), covered with several layers of aluminium foil and Tyvek®. (Image Elsa Yvanez/Sai Island Archaeological Mission)

invasive manipulations necessary to move them in and out of such bags, they can snag on the sharp plastic corners of the opening, and often crumble at the bottom of the bag. Such bags, especially when left for some time in the sun or exposed to heat (an unavoidable parameter in the Nile Valley) will also invariably develop their own interior micro-climate, often leading to condensation and/or mould growth. It is much better to create an intermediary storage and handling solution that will be breathable and easy to manipulate throughout the study.

From their recovery onwards, textiles must be subjected to the least possible degree of manipulation possible. A rule of thumb is to never make them carry their own weight, but to place them on a rigid supporting surface that can be moved in and out of storage without touching the textile at all (Fig. 13.9). This will also help in avoiding contamination for future analyses. For the same reason, it is also recommended to use gloves to avoid touching the textiles directly. Ideally, each textile would benefit from its own rigid support, such as a sheet of Melinex® and/or conservation-grade acid-free cardboard or paper, and then be wrapped in a protective





**Fig. 13.10** Textile fragments from individual 1 (T053) stored in folded envelopes of aluminium foil. Tags are made of conservation-grade polypropylene ‘paper’ sheets. (Image Elsa Yvanez/Sai Island Archaeological Mission)

layer made of woven polyethylene fibre, such as Tyvek®. This material is lightweight, durable, and breathable, as well as being resistant to water and bacterial penetration, which makes it an extremely polyvalent and well-suited tool for textile handling and storage. However, the cost and logistic difficulties, as well as the time investment, of bringing and using such packing material often proves unsustainable for a large body of material. It might still be considered in advance for selected case studies, with excellent results.

In the absence of such material, a cheap and easy-to-find alternative is aluminium foil. This material is non-acidic and durable, and will let the textiles breathe if not wrapped too tightly. Sheets of aluminium foil can be folded into folder-like envelopes, that can be annotated with all the necessary useful information, and placed in artefact trays in single layers (Fig. 13.10). Aluminium can also be creased and adapted to the shape of textiles that are agglomerated in three-dimensional masses.

Whichever solution is chosen, it is of paramount importance to duly label the outer protective layer. Include the artefact number, provenance information (name of site, number of the grave and individual if known), date of find and/or storage, and perhaps mention a referent person (the excavator, the person who has made the mount, or the textile specialist who has last intervened on the piece). It is also useful to include a clearly visible warning on the top, e.g. ‘!! Attention – Textiles – Do not crush !!’.

#### 13.2.2.4.2 Cleaning?

When agglomerated in a compact mass, or even if creased or folded, no attempt must be made to unfold a textile that, when highly desiccated, will very often break along the crease. Under no circumstances should the fabric be cleaned or washed. Even the gentlest of brushes can damage the desiccated or powdery surface of a textile, and much material can be lost through this process, compromising potential future analyses. Brushes can also introduce contaminants, especially if they are made of animal hair. Washing with water will change the composition of the fibre and considerably weaken the structure. At molecular level, it also induces fragmentation and damage patterns. Such steps can only be carried out by a textile conservator or trained specialist, and can only be deemed worthwhile to answer very specific research questions or, in the case of an exceptional piece, ahead of its museum display. In normal circumstances, to safely remove dust and grains of sand, the best solution is to use a manual “air blower”, which will be sufficient to reveal the surface of the textile for its study.

### 13.2.3 *Post-excavation—Intervention of a Textile Specialist*

Once the human remains and the textiles have been found a safe temporary storage situation, they can wait for the intervention of specialists. Ideally, the anthropological and textile study should be conducted together or in quick succession, so the experts can discuss and structure their intervention to gain the maximum information on each burial. For logistic reasons, however, this cannot always occur, and it is important to build opportunities for exchange within the team, during and after fieldwork.

In this protocol, the post-excavation stage is defined as all work that happens after the process of digging the tomb itself, the discovering of the remains, and their preliminary documentation. It comprises the study and analysis of the material in the field, the sampling and analyses conducted through scientific and/or archaeometric methods, and the merging and interpretation of the data. These work phases include different experts and facilities, and adhere to different schedules, from a relatively quick object study to the many months (and years!) necessary for publication.

#### 13.2.3.1 Second Documentation of the Textiles

If the textiles were lifted together with the body or are part of a block comprising human remains, textiles, and sediment, a second phase of *in situ* documentation can be carried out. Depending on the recording strategies chosen in the field, this stage can very usefully complete the previously acquired documentation, since more time and easier access to the remains are now afforded by the more controlled environment.



If the remains and textiles were found disturbed and not in association, and the textiles were therefore lifted separately, a textile specialist can proceed directly to the textile analysis. In this case, a copy of all necessary *in situ* information—collected during excavation by the archaeologist or the anthropologist—must be adjoined to the textile study and records.

The documentation methods are the same at those previously quoted and detailed below (cf. Fig. 13.5). They can be selected, tailored, and refined depending on what was done in the field, and include:

- Identification of the number of different fabrics (aided by high-resolution examination);
- Mapping the textiles on the body;
- Photographs, including of detailed areas.

At the end of this stage, both archaeologists and textile specialists must be able to reconstruct and understand the arrangement of the textiles on the body, as far as the evidence permits. The records should be able to give sufficient information and visual aids to track each textile to their location on the remains, and provide a good presentation of the inhumation as a whole.

### 13.2.3.2 Textile Analysis

As the second *in situ* documentation phase happens, textile analysis can also start, especially to precisely identify the number of different fabrics present on or around the body. The principles of textile analysis, as defined for archaeological material, can be followed (see below). In general terms, the process consists of determining all the technical characteristics of the textile, from its raw material (fibre identification), to the spinning and weaving techniques, all the way to the eventual tailoring and added decorative designs. A careful recording of creases and use wear, as well as the mapping of knots, sewing, etc., can provide precious information on the original function of the piece.

The extent of this study is, in part, determined by how much of the textile is accessible: if the fabric is still *in situ* around the body, it will be impossible to recover all possible information on the full size and shape of the piece, and that complicates the understanding of function and use. It will also be difficult, if not impossible, to carry out a full analysis of the weaving techniques. However, high-resolution digital photography and hand-held microscopes (such as DinoLite®) permit high-magnification examination without disturbing the textiles and are therefore precious tools, provided appropriate scales are used at all times (Fig. 13.11).

In the case of a body lifted and preserved with its wrappings, it is very important to conduct as much of the textile analysis *in situ* on the remains before lifting any of them, as damage often occurs to the textiles during this delicate operation.



**Fig. 13.11** Main tools for the documentation of archaeological textiles. (Image Chloé Nolibois/CTR)

Once laid on a suitable support, the textile fragments are fully accessible for a complete analysis, including—if done carefully—the documentation of both of its two faces.

At this stage, it is important to remember to update the inventory numbers, if one group of wrappings is discovered to in fact be made of several different textiles (see above *A Note on Numbering*).

### 13.2.3.3 Sampling for Scientific Analyses

After the textile analysis, the specialist will have a good idea of the different constituents of each piece, why this particular specimen may be of interest, remaining unanswered questions, and what can be gained by further analyses. If the textile study was conceived by the whole team as part of the overall research strategy, the team will have undoubtedly considered a series of analytical laboratory methods able to shed light on many different aspects of past daily life on the site. Being made of organic material, textiles are very good candidates for such analyses and different methods—in constant development over the past few decades—can be applied to such an end. This is not the place to review each one in detail, and selected references can be consulted in the bibliography. However, a simple list can perhaps help archaeologists to understand the range of information to be gained, and thus assist in choosing the method(s) relevant to their research questions.

Questions	Methods	Wider research topics
When?	Radiocarbon dating	Chronology of the inhumations General dating
What?	FTIR	Plant vs animal fibre identification Identification of other elemental components (e.g. mineral pigments)
	Transmitted or polarized light microscopy, Scanning Electron microscopy	Fibre identification based on morphological traits (depends on the conservation of the sample)
	HPLC-MS	Identification of dye plants and craft knowledge
	Palaeoproteomics and ZooMS (or peptide mass fingerprinting)	Identification of animal species providing wool fibres Pastoralist practices
	aDNA	Species identification, possibly differentiating breeds, and genomic expression for wool production. Limitation: aridity has greatly hindered the preservation of aDNA in human remains found in Sudan. For now, attempts at aDNA analyses have proved unsuccessful, which might change with the application of whole genome sequencing (as opposed to mitochondrial DNA) and the development of extraction and library preparation methods, as well as capture enrichment.
Where?	Isotopic analyses (e.g. strontium isotopes)	Origin of the textile (or raw material of the textile), in vs. out of Sudan. Limitation: the geological composition of the Nile valley and almost unique source of water throughout this vast territory does not allow for a fine identification within this space. This method is still in development (see references) and new possibilities may open.

In order to carry out some of these analyses, it is necessary to bring samples of the textiles to the laboratory where they will be conducted, often through collaboration with partner institutions or through commercial labs. To this day, such facilities are not available in Sudan, and the National Corporation for Antiquities and Museums allows, under certain provisions, the exportation of samples outside of the country. Thanks to this type of agreement, it is now possible to explore a whole range of analyses on ancient textiles to better understand their surrounding environment. They can also provide precious dating indications when the absence of grave goods or imprecise artefact typologies does not permit an inhumation to be assigned to a specific period. When coupled with analyses carried out on the skeletal remains themselves, or on the stomach content and other soft tissues preserved in naturally mummified bodies, archaeologists are presented with a tremendous opportunity to reconstruct the past environment and lived experience of a given population.

Some of the analyses mentioned above will lead to the total destruction of the sample, and it is therefore important to schedule the analyses from non-destructive to completely destructive, in order to gather as much information as possible. It is, for example, essential to plan microscopic imagery before any isotopic or proteomic analyses. Nowadays, such methods only require a small amount of material and it is

often the case that multiple analyses can be carried out on the same fragment of textile, sub-divided into several thread samples. However, their high cost (especially of aDNA and radiocarbon dating) often limits the range of the inquiries that can be undertaken. To guarantee the usefulness of the sample, a few simple guidelines can be followed while retrieving the samples:

- Limit all contamination. This is especially important for radiocarbon and aDNA analyses. For this reason, it is better to sample textiles destined for these methods as early as possible during excavation. Handle the textile with non-powdery nitrile gloves, avoiding any intrusive carbon material (such as regular paper, cardboard—or nearby smoking). Avoid contamination from your own clothing, especially if made of wool, and from your own hair and skin. It is also important to avoid cross-contamination between samples, by keeping them separate when possible and cleaning tools between processing each fragments (using bleach or ethanol);
- Record the samples' provenance within the textile. Note its general position on the piece and whether the sample comes from the warp or the weft. If possible, it is best practice to sample each one in turn. Avoid taking a sample from the loose threads and fragments detached from the main piece, as those could be intrusive and may have been handled more often. However, this might be advisable if it is necessary to preserve an area with a decoration for example, which ought to stay untouched;
- Store the sample appropriately. Small fragments of textile should be placed within layers of aluminium foil and in a plastic find bag, and duly labelled. Smaller samples of single threads can be placed in lab-ready sample tubes, such as centrifuge tubes, which can be purchased in bulk from online stores and do not take much space.

The actual quantity of textile necessary to carry out each destructive analysis varies with the rapid development of several of these methods. It is currently advisable to sample <30 mg of textile for radiocarbon dating and <10 mg for proteomics and isotopic analyses, which can be retrieved as one or several lengths of thread and weighed with a high-precision scale such as those used by jewellers. If retrieving several lengths of thread, it is important that they all come from adjacent threads in the same system (either warp or weft), since the two systems can be made with threads of different material and provenance. The sampling of a small fragment of the woven structure or of lengths of threads would depend on the number and workflow of the planned analyses, their destructive nature, and, ultimately, on the research strategy.

#### **13.2.3.4 Securing and Preparing the Textiles for Long-Term Storage**

After all observations and documentation methods have been carried out, and after samples were retrieved if necessary, it is time to secure the textiles for long-term storage. The objective here is to provide the material with a stable and protected environment that will guarantee its preservation and allow further analyses if

deemed useful in the future. Once again, minimum intervention and well-conceived packing strategies are the two most important approaches to consider. Practical information and storing tips can be found below in a dedicated section of this chapter.

### **13.3 Documenting Textiles: From Location Mapping to Detailed Artefact Analysis**

This section aims to give more detailed tips and examples of different documentation methods. Many of these methods can be carried out by archaeologists or anthropologists during excavation, and do not require any specific knowledge of textile techniques and terms. Others rest on a finer understanding of textile manufacture, and therefore necessitate the intervention of a textile specialist. Either way, many experts working on archaeological sites—regardless of their specialized field of research—often have a broad skill set that can be tapped into. Drawing from the complementary expertise of all team members is the best way to enhance the recording of funerary textiles.

#### ***13.3.1 Excavation and/or Post-excavation Phase: Enhancing Basic Archaeological Recording***

As previously mentioned, the “missing link” in many studies on funerary textiles is often the precise recording of textiles *in situ* on the remains. In a more comprehensive workflow, such a phase should intervene as soon as the remains become accessible, *in situ* during the excavation, or shortly thereafter if the whole wrapped body was lifted. In practice, this is rarely carried out in the tomb itself, the narrow cavity of which often complicates the matter. This recording can be as quick or as thorough as time and training permits, and can be complemented in a second phase when the remains have reached the excavation house.

##### **13.3.1.1 Preliminary Assessment of the Number of Different Textiles: Visual Grouping**

In order to proceed to the mapping of textiles on the body, it is useful to consider how many textiles formed the wrapping layers. This will help to determine the wrapping practices and inform the way the body should be excavated and recovered. At this stage, this is only a very preliminary assessment that should be limited to a general visual grouping. Meaningful traits include colour and general aspects of the weave, such as “coarse” or “fine”. This appreciation is subjective and can be rapidly done by anyone during excavation.

### 13.3.1.2 Preliminary Textile Inventory and Basic Notes

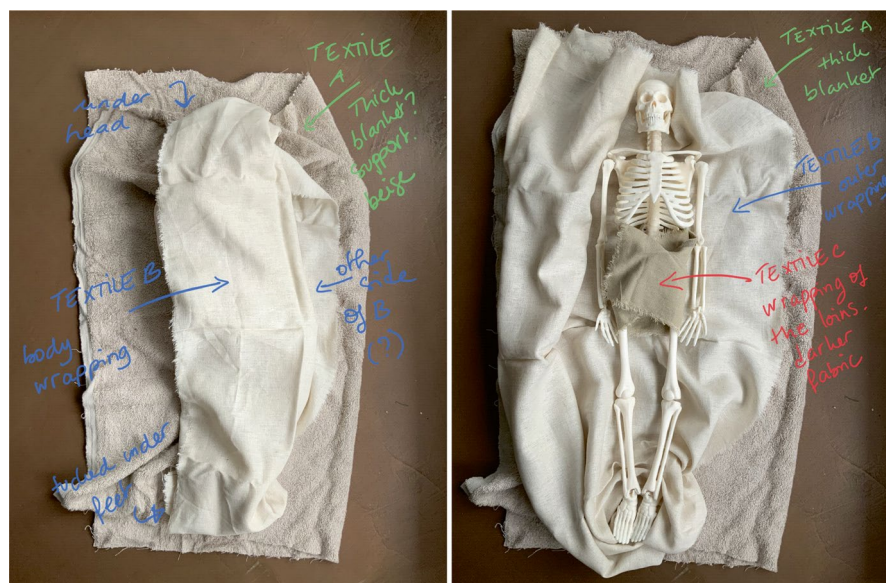
From there, a preliminary textile list can be produced and an inventory number given to the artefact. As previously explained (see *infra*, *A Note on Numbering*), it might be good at this stage to use a unique textile number for all the wrappings, if clear distinctions cannot be readily observed by the naked eye. If differences are noted however, it is necessary to assign different artefact numbers to each item. It is often the case, however, that things look very unclear. Either way, before any textile determination can settle the inventory list, the simple use of letter annotations and a very brief description of the artefacts and their context can provide ample information. In the mock-up example below (Fig. 13.12), the three different fabrics can be quickly listed as:

Textile A: thick fabric, light beige/tan in colour, with loops (?), visible under the body from head to toe. Covers an area of approximatively XX x XX cm. Looks like a blanket??

Textile B: thinner fabric, light beige/grey, visible under (?) and over the body, with folds especially recognizable on the skull and feet (tucked under?). Outer wrapping cf. shroud?

Textile C: relatively thick (coarse?) fabric, dark brown, visible in the pelvis and thigh area. Seems to surround the body, wrapping the hips.

At this stage, it is very important to maintain a uniform terminology, free of potential interpretations that might prove untrue after thorough examination. Sustaining the same terms throughout all documentation, especially on the site



**Fig. 13.12** Mock-up examples of basic annotations and textile descriptions, at two different stages of uncovering the remains. (Image Elsa Yvanez)



database, will also dramatically facilitate research. For example, the terms “linen”—i.e. identifying the textile as being made of flax fibres—or “shroud”—i.e. identifying the textile strictly as a funerary covering—can become extremely misleading. It is better to limit the description to generic material terms like “textile”.

### **13.3.1.3 Mapping the Location of Textiles on Human Remains**

Once this basic grouping and listing are made, the most useful step that can be taken while documenting textiles on human remains is to precisely map their location. In truth, these steps should be carried out hand in hand, with the mapping providing an essential visualization for the description. Different strategies can be chosen and combined depending on the time available and the training of the researcher.

#### **Sketches**

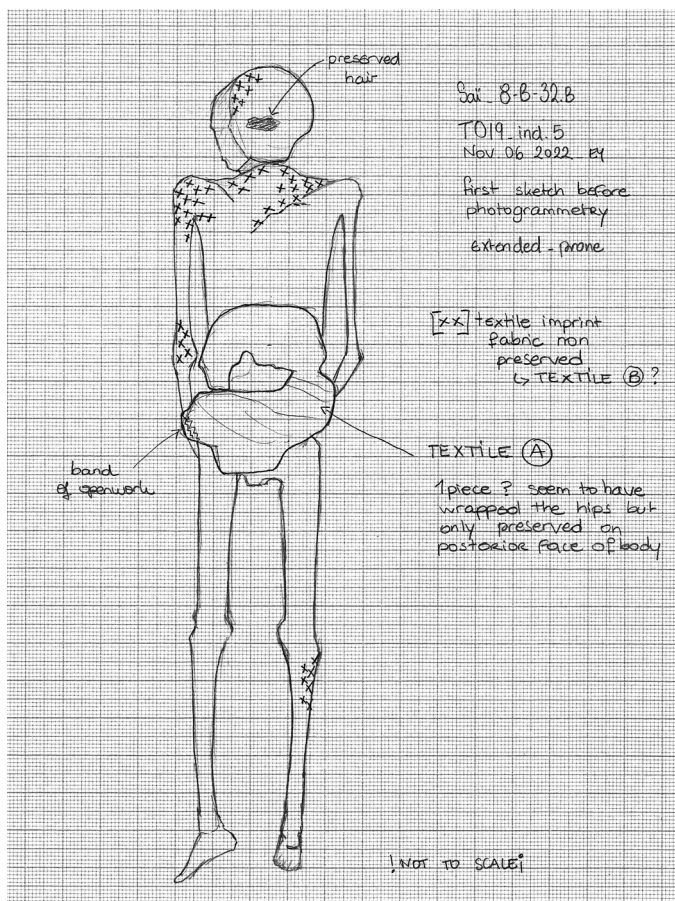
The position of textiles can be very quickly jotted down on any recording form or notebook, in a simplified sketch (Fig. 13.13). Its advantage is the rapidity and ease of the method, which can very easily be complemented with annotations, legends, and other information. This process also forces the precise observation of the remains and can be the moment when many distinctions and the positioning of the textiles become understood.

#### **Drawing**

In the same vein, a proper archaeological drawing is often a very precious aid, as it records the human remains before any movement occurs and promotes active participation in the understanding and interpretation of the burial (Fig. 13.14). However, several caveats need to be noted. The first is that textiles are actually quite difficult to render accurately on a plan drawing, due to their fragmented nature and thin surface. They tend to be drawn as a flat surface laid on top of the remains and sometimes coded with hatching or similar symbols, which does not really represent the reality of the burial, and furthermore does not provide us much information about the possible continuation of the textile around and under the body. The second caveat is the sheer time and talent necessary to produce such detailed drawings, in which many points need to be taken, both in plan and elevation, and faithfully transcribed in an anatomically correct drawing. Today, such luxuries can seldom be afforded in the field. The third caveat, stemming from the previous point, is that textiles often obscure the skeleton. For this reason, they may be removed from the burial so the anthropologist can accurately draw the remains, since producing two drawings, one with textiles and one without, would be deemed too time-consuming. Therefore, in the absence of a very competent draughtsperson on the excavation, an annotated sketch and good photography coverage might be a better option.

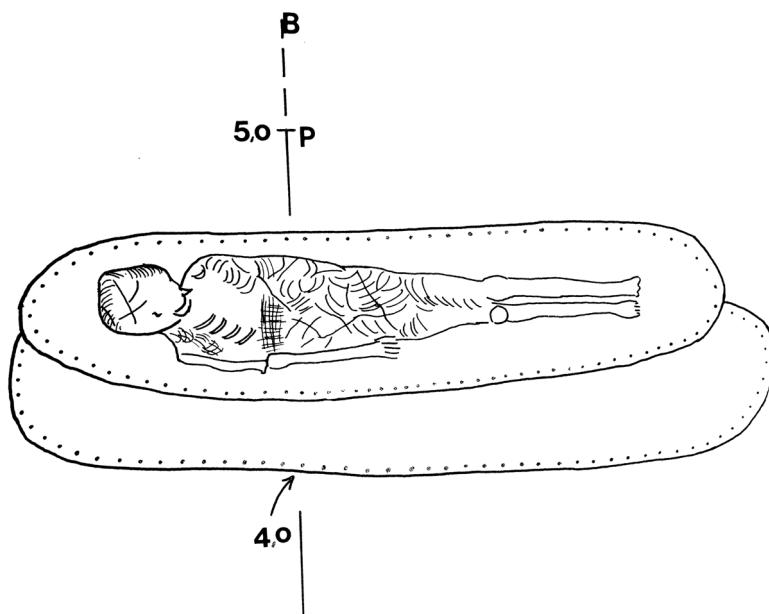
#### **Photography**

The advent of digital photography is possibly one of the greatest advances in modern textile archaeology. Comprehensive photographic coverage of the wrapped remains will provide invaluable documentation. However, several precautions must



**Fig. 13.13** Quick sketch of individual 5 (T019), with location and description of textile traces *in situ*, before photogrammetry and detailed study. (Image Elsa Yvanez/Sai Island Archaeological Mission)

be taken. The first is the absolutely essential use of a scale. The second concerns detail shots: without proper recording, it will be very difficult to place a specific narrow detail picture on the wider body or textile. The use of markers around the body and the completion of a photo log can help in that regard, but that is another added step that can become difficult to commit to fully. Detailed notes and observations can help bridge the two sets of data (Fig. 13.15). Photographs, both general and detailed shots, can be taken in the hundreds for each inhumation or textile set, and need to be in either .tiff or .jpeg formats (minimum 300 dpi). It is therefore important to plan enough digital storage in the shape of SD cards and external hard drives, as well as on remotely hosted servers if a high-speed internet connection can be secured on site.



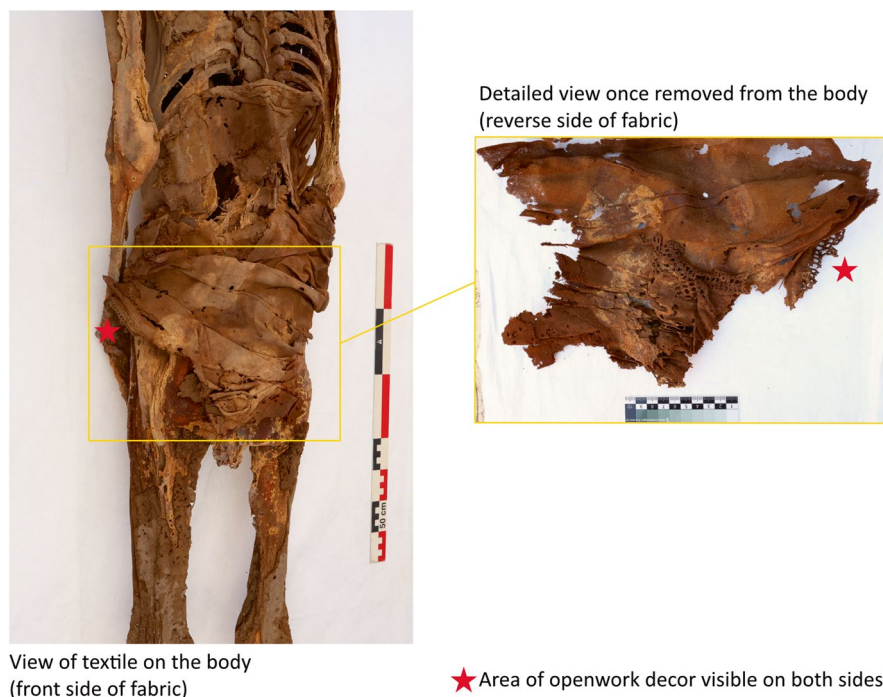
**Fig. 13.14** Example of plan drawing on an inhumation containing wrapped remains, Site 63/1G. (Image Rayan Alhag, from an archival drawing of the Scandinavian Joint Expedition to Nubia, courtesy of the Gustavianum, Uppsala University Museum)

### Annotating Photographs

Another strategy consists of directly annotating photographs (Fig. 13.16). This can be done in the post-excavation phase, merging data from written notes, sketches, and photos, using photo editing software. It can also be done directly while examining the remains, using a tablet and a photography and/or graphics application. The researcher can then choose to trace any visible textiles directly on the photograph, adding any information he or she deems necessary. Depending on the setting, this method has proved very satisfactory for combining different methods and types of observations directly in one document. It might, however, be difficult to carry out on the dig site, where the weather could generate problematic levels of dust and luminosity. In general, annotating the photographs is an essential phase that can really help in understanding the data. Indeed, it is sometimes very difficult to distinguish textiles from bones and skin, and from the surrounding sediment matrix, when working on inhumations that are often impossible to photograph in an optimal light setting.

### Photogrammetry

A very useful tool, in the process of becoming routinely used in archaeology, is photogrammetry, or the 3D modelling of archaeological features from a set of digital photographs. Nowadays, this can be done with open source software, and needs

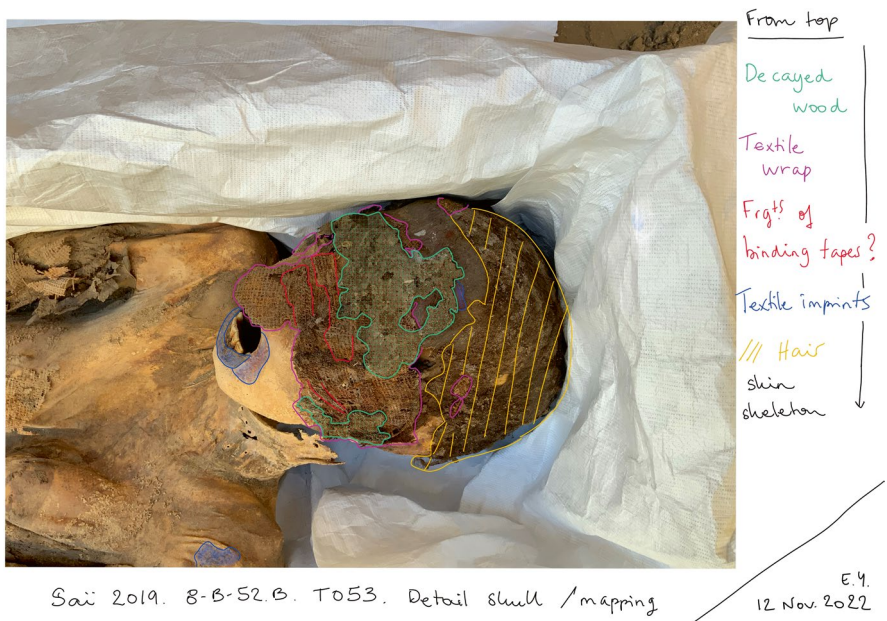


**Fig. 13.15** Examples of general and detail photographs of the fabric found *in situ* on individual 5 (T019), with localization and captions of technical details. (Image Elsa Yvanez/Sai Island Archaeological Mission)

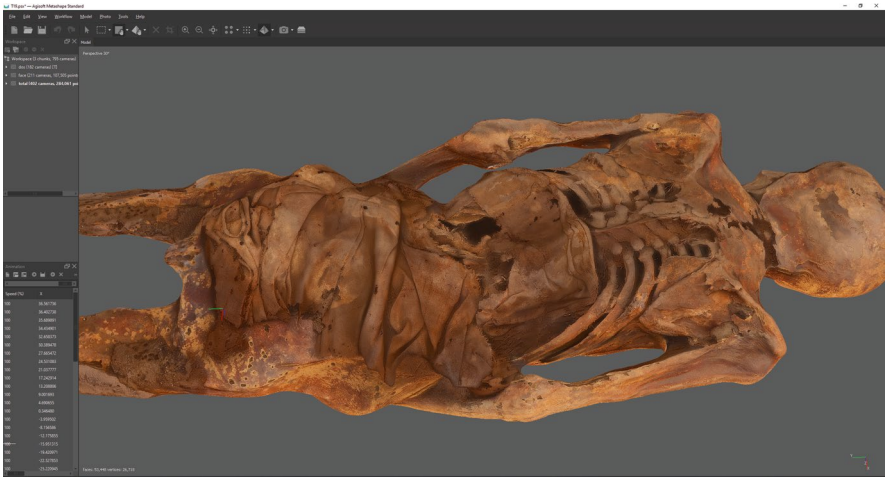
little training before useful results can be obtained. Models can already be built from a relatively small set of photographs taken in less-than-optimal conditions right after excavation. Even at low quality, they can provide very useful information on the location, position, and layering of the textiles around the body. With more time and training, and depending on the preservation of the remains, it is also possible to build a full model of the body, stitching a front and back view together to make its digital manipulation possible (Fig. 13.17). The high definition of such a model allows for the tracking of different textiles around the body. As an alternative, 3D models can also be generated with 3D laser scanning, using a portable hand-held scanner. However, preliminary tests have shown poorer results than with photogrammetry, especially concerning the definition and textural rendering of textiles.

Time constraints are often the biggest challenge for carrying out detailed and consistent recording techniques. To gain time and encourage the sustainability of such practices, it might be beneficial to build useful recording tools that can be used by everyone—excavators, archaeologists, and anthropologists, as well as textile specialists. Such polyvalent tools can be analogue and very easy to implement, such as a recording form that includes the main information, both anthropological and





**Fig. 13.16** Annotated photograph visualizing the superposition of wrapping layers on the skull of individual 1 (T053), created on a tablet with the ProCreate® app. (Image Elsa Yvanez/Sai Island Archaeological Mission)



**Fig. 13.17** Screenshot showing the 3D model of individual 5 (T019), created with the Agisoft Metashape® software. Model Elsa Yvanez and Loïc Bouffard/Sai Island Archaeological Mission

textile-related, or digital and a bit more time consuming to implement, such as the 3D modelling of the inhumation. Both methods, by themselves and certainly when combined, offer a good level of information useful for all.

Whatever the recording method, the golden rule is to pair the mapping of textiles with detailed written notes and illustrations. In the process of forming such documents, much can be learned already on the different funerary gestures that preceded the burial of each individual.

### ***13.3.2 Post-excavation: Intervention of a Textile Specialist***

This section does not aim to give a comprehensive guide to textile analysis, but rather to provide general notes for non-specialists to understand the method behind textile analysis and what we can learn through it. Because textiles are defined by a specialized terminology, their study is often deemed arcane. That does not, however, need to be the case, if a textile is approached with its simplest definition in mind.

#### **13.3.2.1 Textile Analysis and Documentation**

In its simplest expression, a textile is a woven or non-woven pliable surface created through the multi-step transformation of fibres. In the case of woven textiles, the fibres can come from different sources, either animal (e.g. wool, silk) or vegetal (e.g. flax, cotton, hemp), and sometimes even mineral or metallic (e.g. asbestos, gold). These fibres are assembled into threads and then woven into a textile, according to different techniques. The finished textiles can be used as they are or go through a final transformation stage into different items through cutting or sewing. Additional dyeing and other ornamental methods can intervene at different stages of the *chaîne opératoire*. The material and technical choices made by the craftspeople along this fabrication process led to the creation of different textile traditions and cloth cultures across the globe.

The same succession of stages can be used to guide our analysis. Four main stages need to be documented, and each in turn will provide information on the procurement of raw material, the spinning or splicing of threads, the weaving of the textile, and finally the assembling of the fabric into a specific item ready for use. This translates into four main categories:

- Fibre analysis: identification of the fibre origin, either animal or vegetal, and of the possible species. In some cases, this stage can be done in a preliminary manner from low magnification observations, but it can only be verified through microscopy or elemental analyses (see *infra* on sampling);



- Thread analysis: observation of the physical alterations of the fibres to be assembled into threads and characterization of the threads themselves (diameter, spin direction, and angle). This needs to be carried out for both the warp (vertical) and weft (horizontal) systems, as well as for any sewing yarns or dyed threads used in decorated areas;
- Weave analysis: recording of the technical characteristics of the weave, i.e. the system that binds the two sets (or more) of threads together. Depending on the type of loom used and the local tradition, many different weaving techniques were developed. They are characterized by the type of binding system (e.g. tabby) and by the number of threads by cm. Useful information is also contained in the edges of the cloth, which also need to be recorded and described;
- Analysis of sewing, tailoring, and other potential manufacturing steps. This includes the description of decorative (e.g. embroidery) or functional (e.g. hems) sewing that contributed to the final form of the textile and gives us clues as the original function of the piece.

Beside the stages that preceded the manufacturing of the textile, it is also important to record any signs documenting its life: use wear traces, repairs, or signs of reuse are all precious information for understanding how the cloth was used before it was interred with the dead.

Throughout this process, imagery must be created for every criteria recorded (Fig. 13.18). Developments in portable hand-held digital microscopes (e.g. DinoLite®) allow for greater and greater magnification, with an increasing image quality, and are proving invaluable for modern textile studies. Detailed photographs of specific manufacturing aspects and features also need to be taken and archived.

In practice, the recording of textiles implies the compilation of tens of different information fields, a process that is best managed with a purpose built database system, sometimes seconded by paper forms in the field (Fig. 13.19). Properly used, such a database allows the export of data for quantitative and statistical analyses, helping to define the textile material landscape of a whole site, region, or period.

This type of analysis refines the preliminary observations made in the field and can, in such cases, distinguish the presence of different textiles in clearly defined technical groupings. From there, the artefact inventory can be updated with its final numbering, one unique identifier being given to each fabric.

It can also support the analysis and understanding of the micro-stratigraphy of textile layers, revealing the succession of different textiles around the body, from the layer closest to the skin to the outer layer of the wrappings.

All this information can join the other types of data recorded for an inhumation and contribute to a holistic interpretation of the funerary gestures and rites. Beyond the grave itself, it also provides us with much information about agricultural and pastoral economies, craft activities, and socio-cultural practices.



**Fig. 13.18** Montage of different photographic views of the same bast fibre textile from individual 1 (T053): (a) general view, normal photograph; (b) detail of the selvedge, normal photograph; (c, d) DinoLite® photographs of the ground weave and the selvedge, 50× magnification; (e) DinoLite® photograph of a thread, 215× magnification; (f) transmitted light microscope photograph of the bast fibres, taken with a Leica DM750, 10× magnification. (Image Elsa Yvanez/Sai Island Archaeological Mission—microscope photograph Chloé Nolibois)



### 13.4 Practical Storage Solutions for Preventive Conservation (by Valentina Turina)

In an arid context, extreme environmental conditions reduce natural microbial activity, thus creating favourable conditions for the conservation of large quantities of textiles. In fact, it is difficult to find the same quantity of archaeological fabrics and the same preservation quality in other types of excavation environments outside arid regions (Peacock, 2003: 12).

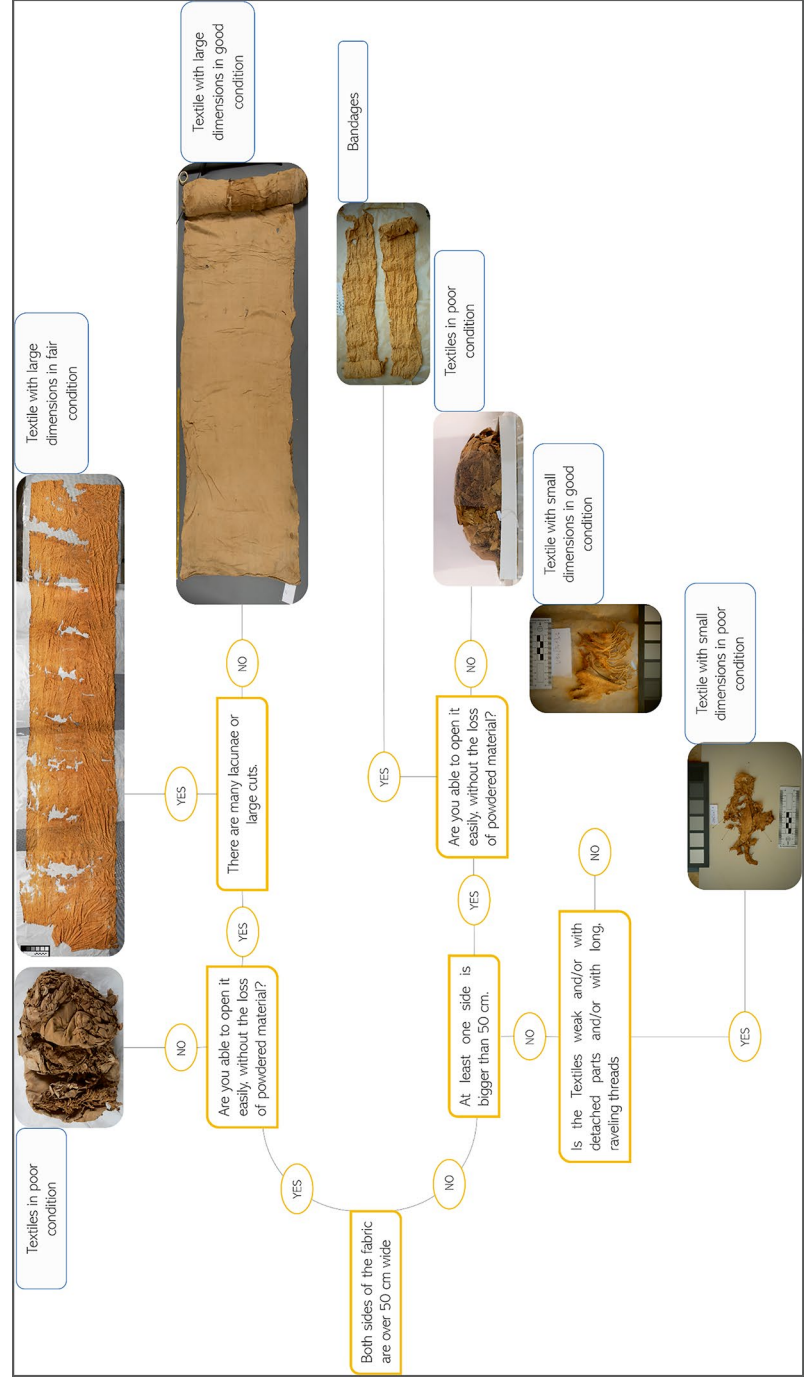
However, it is difficult for the excavation team to manage and preserve funerary textiles. The conservation of this type of material can be expensive and often includes materials and methods that are completely different from those used for the treatment of other materials, such as ceramic and stone.

Although the presence of qualified personnel is necessary for more complex conservation treatment, some basic operations can nonetheless guarantee the long-term safety of funerary textiles:

- Examine the textile in detail for signs of entomological attacks: holes in the fabric, dust from erosion, or even the presence of insects, could indicate an entomological attack.
- If some or all of these elements are present, it is advisable to isolate the fabric from the rest of the objects. If the entomological attack is still underway, it could contaminate the other organic finds;
- It is possible to carry out a mechanical surface cleaning using brushes with soft bristles: it would be good practice to follow the direction of the weaving and carry out the cleaning in the direction of the warp and weft. The safety of the fabric comes first: only clean if the fabric is in excellent condition, without cuts and unravelling thread (see Dichotomous key, Fig. 13.20). When the fabric is more fragile, a hand-operated air blower is best to remove leftover dust or sediment.

Funerary textiles encompass several types of fabrics, which differ in terms of shape, dimensions, and conservation condition. Upon discovery and during the first stage of recovery during excavation, it is important to make a proper assessment and distinguish several factors that will later determine conservation strategies. The combination of (1) conservation conditions, (2) size, and (3) the need for scientific study will be crucial to the design and implementation of the most appropriate storage system.

The challenge lies in having the appropriate sensibility to recognize these three factors and understand how their combination may give us information about conservation and storage requirements. For this purpose, we suggest a sort of “dichotomous key” that enables classification of the textile into macro categories (Fig. 13.20). This classification can then guide us towards the most appropriate handling and storage method, taking into account common practicalities and difficulties, such as the recovery of very large quantities of textiles or operating within a limited conservation budget.



**Fig. 13.20** Dichotomous key: diagram categorising the types of textiles based on their state of conservation and associated conservation strategies. (Image Valentina Turina)



### 13.4.1 *Macro Category 1—Textile with Large Dimensions in Very Good Condition*

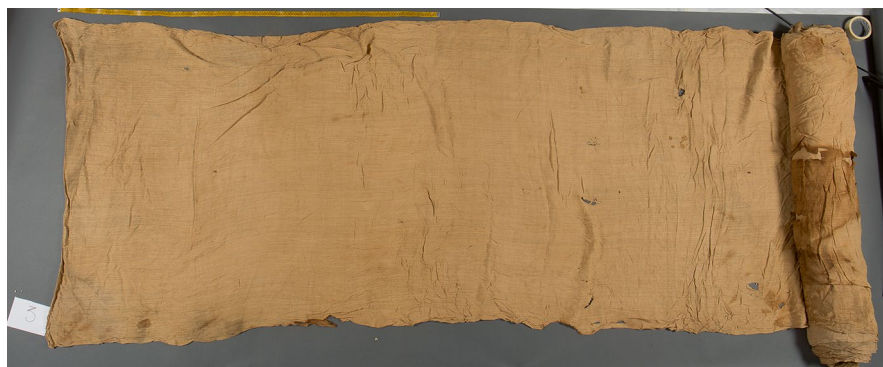
- Main characteristics (Fig. 13.21): the fibre is soft to the touch and pliable. The textile can be moved and folded easily. There is no loss of material during handling. There may be some tears, but these appear as clean and circumscribed cuts. There is no encrustation and/or overgrown material present.

In these cases, the size of the fabric is the predominant factor affecting storage considerations. Large textiles, sometimes up to 10 m long, can hardly be stored flat. An excellent space-saving storage system for this type of textile is **rolling up** (Fig. 13.22).

Regarding the support, rolling can be done with a different variety of tubes, which can be chosen according to the dimensions, local availability, and budget. For a list of possible options, see the table at the end.

The first step is to select a tube with appropriate dimensions, based on the textile that will be rolled. Taking into consideration the archaeological provenance and the dimension of these fabrics, the diameter of the tube should be at least 15 cm.

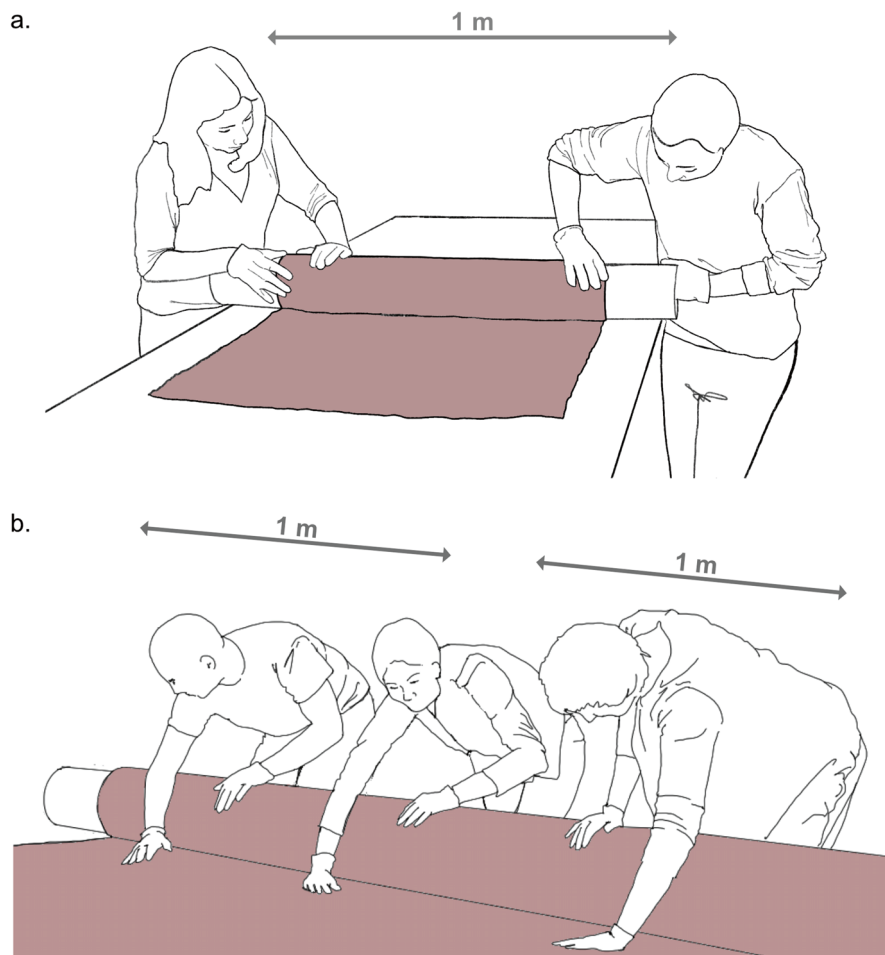
Many types of tubes can be used to roll textiles. From a conservation point of view, the best material is an acid-free cardboard tube that is guaranteed to be free of any kind of acid degradation products. When it is impossible to use this kind of support, we can find alternative solutions from building suppliers, such as a UBS tube or SONO tube. However, these types of tube are not acid-free; it is good practice to wash them with water and detergent prior to their use.<sup>15</sup>



**Fig. 13.21** Shroud S.13967/4, Gebelein, Northern hill—Tomb of the Unknown. (Image Museo Egizio, Turin)

<sup>15</sup> A detailed description of the rolling system is also provided by the Canadian Conservation Institute: CCI Note 13/3. <https://www.canada.ca/content/dam/cci-icc/documents/services/conservation-preservation-publications/canadian-conservation-institute-notes/13-3-eng.pdf?WT.contentAuthority=4.4.10> (consulted on 27/03/2024).

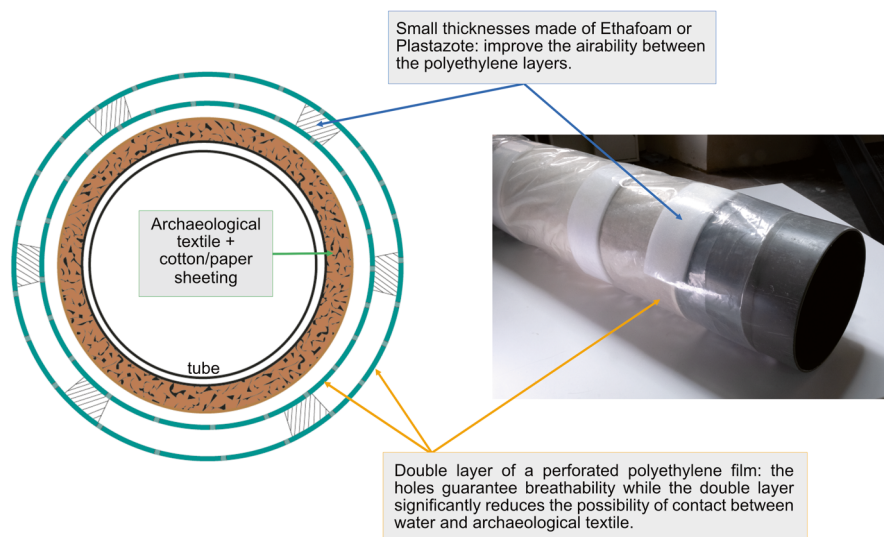




**Fig. 13.22** Rolling an archaeological textile: (a) two people working on a fabric with a height equal to or less than 1 m allows constant and homogeneous monitoring of the surface (by stretching their arms). (b) Three people working on fabrics higher than 1 meter: the person in the centre allows constant and homogeneous monitoring of the surface. (Drawing Valentina Turina)

Before starting with the rolling procedure, check the space and prepare it to accommodate the entire textile. If your tables are not big enough, you can do the rolling activity on the floor after covering it with a Maylor or polyethylene film. The tube should be covered with plastic film and then with acid-free paper or prewashed cotton sheeting. This practice is essential if you choose UBS or SONO tubes: the plastic film is a good barrier against their acidity. Then, set the tube parallel to either the warp or the weft threads, or, if you are not sure, parallel to one of the thread systems.

The textile should be fully unfolded before rolling, and it is crucial to take extreme care about the tension of the fabric. If the textile is too loose, unwanted



**Fig. 13.23** Rolled textile cover. (Image Valentina Turina)

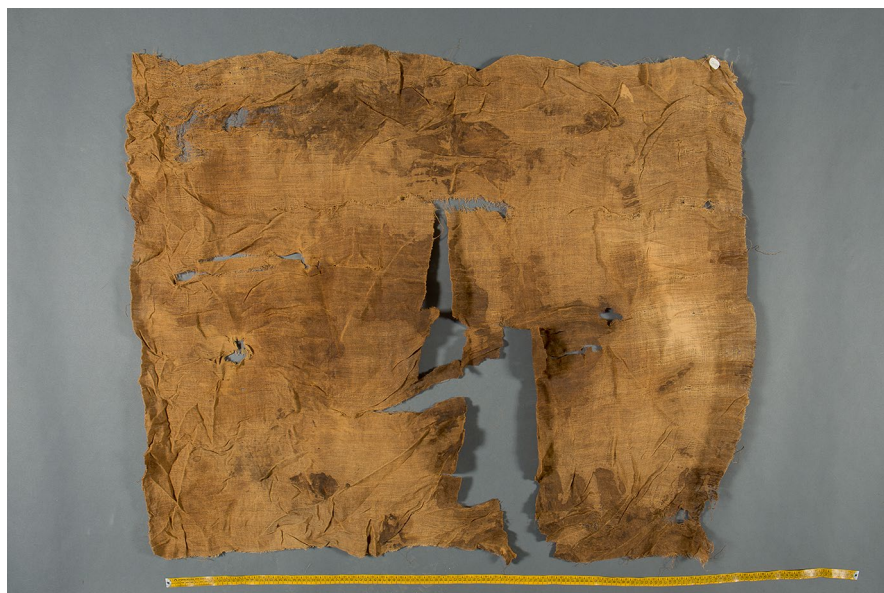
creases may form between the layers of rolled-up fabric. To avoid this, it is recommended to have at least two people (three for fabrics with a length of more than 1 m) constantly monitoring the tension of the fabric portion already rolled up, ensuring that it adheres perfectly to the tube. If the textile surface appears to sag excessively, it can be recovered by lifting the tube and gently stretching the remaining fabric to be rolled up. It is good practice to place a layer of undyed cotton sheeting as a support for the entire surface of the textile.

As previously described, the climatic conditions that characterizes arid regions often include occasional heavy downpours. It is therefore essential to create a cover for the tube that is both breathable and waterproof.

A material often used for the conservation of textiles in excavation and field settings is aluminium foil, even though for large fabrics it may be somewhat challenging. However, using aluminium is not always possible. Another excellent option is perforated plastic film, as illustrated in diagram Fig. 13.23: the double overlap is a good barrier against water, while the holes guarantee breathability.

### 13.4.2 Macro Category 2—Textile with Large Dimensions in Fair Condition

- Main characteristics (Fig. 13.24): the fibre feels dry to the touch, it is possible to fold the textile but it remains slightly stiff during handling. Small loss of pulverulent material is noticeable. Medium-sized lacunae may be present. There are encrustations and/or material on it.



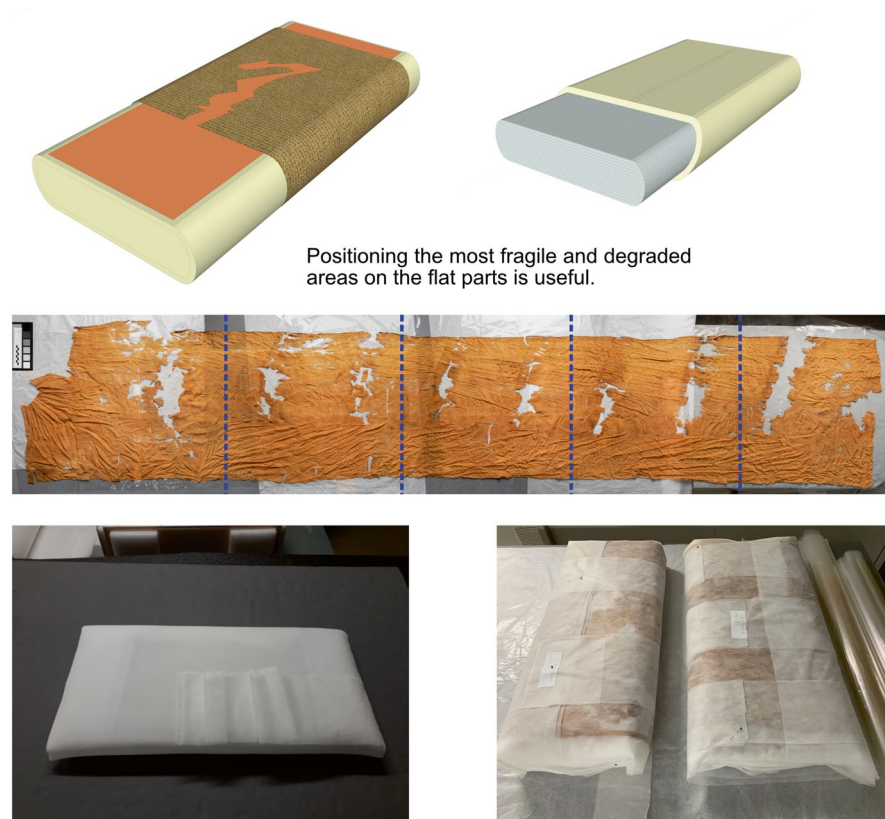
**Fig. 13.24** Example of a large textile in fair condition: shroud Provv.0540/11, provenance unknown. (Image Museo Egizio, Turin)

Textiles in fair condition should not be rolled on a tube. A good option to save storage space while preserving the artefact is an **ovoid-shaped holder** (Fig. 13.25). As described in the diagram, the ovoid section consists of a soft support (pillow) that allows for a wider curvature (calibrated according to the condition of the textile) and a wider circumference. The “flat area” (indicated in the graphs by the colour red) better accommodate any lacunae.

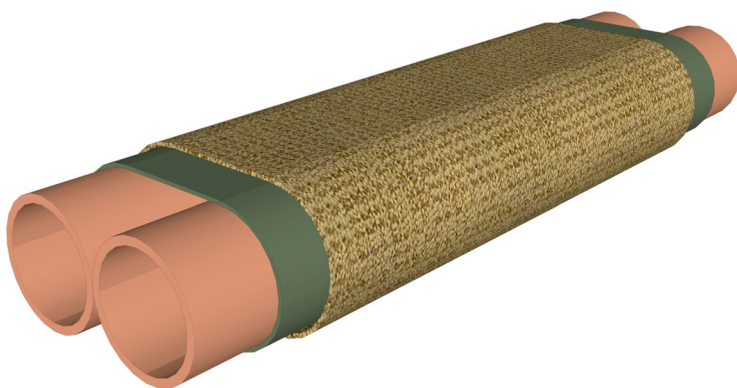
Many materials can be used to make this kind of “pillow”: polyethylene foam, polyester padding, cotton sheeting rolled and covered with acid-free paper, prewashed cotton sheeting, Tyvek®, or Plastazote®. The best method is to close the external layer of the pillow with stitches. Alternatively, make two and a half turns with the external layer and close the lateral ends with pins and/or tape (located as far as possible from the archaeological fabric).

Often, large shrouds, as in Fig. 13.25, may have similar lacunae repeated and spread systematically along the entire surface. This can be used as a guide to design the support: the size of the flat area can be precisely calibrated according to the dimensions of the lacunae.

A different option is to make an oval support by joining two tubes, as shown in diagram Fig. 13.26. In this case, the size of the flat area is *de facto* imposed by the circumference of the two tubes and it is not possible to adapt it at our own discretion. However, by choosing tubes with a large radius (a diameter of more than 20 cm is always recommended), it is equally possible to accommodate dehydrated fabrics.



**Fig. 13.25** Soft pillow construction scheme and schematic/photographic rendering of the soft pillow installation within the rolled shroud S.05142/02 (Museo Egizio, Turin). (Image Valentina Turina)



**Fig. 13.26** Oval support made by joining two tubes. (Drawing Valentina Turina)

The rolling procedure and the type of coverage are very similar to that shown for Macro Category 1:

- A safe and large area to roll the textile;
- Two layers between the support and the archaeological textile (plastic film + acid-free paper or prewashed cotton). Please note that, if you made a soft pillow, the plastic film is not necessary;
- Archaeological textiles should be fully unfolded and placed orthogonally to the support.

### ***13.4.3 Macro Category 3—Textile with Large Dimensions in Poor Condition***

- Main characteristics (see Fig. 13.28): the fibres are extremely dry to the touch. Every little movement causes loss of material and/or the textile remains rigid in its initial position. The natural elasticity of the fibre has been completely lost. It is impossible to open the fabric. Possible presence of encrustation and overgrown material.

Textiles in this category should not be opened or manipulated during the initial first-aid phase. Conservation intervention by a specialist is required to rehydrate the fibres and allow partial opening. To store these textiles, non-acidic cardboard boxes or trays can be used. If needed, small soft cushions can be used to support the fabric's irregular shape. In cases of significant material loss, it may be helpful to create small containment bands, as illustrated in the diagram.

The elasticity of tulle bands allows the fabrics to be locked into their original position. The tulle containing bands can be sewn on themselves with a simple thread or string, or, in the absence of tailoring skills, they can be closed with a simple knot (Figs. 13.27 and 13.28). The cover material must be chosen according to the size of the piece: aluminium or non-acidic cardboard box (coated) for the small specimens and/or nylon for the larger.

### ***13.4.4 Macro Categories 4 and 5—Textile with Small Dimensions***

The best storage method for small fragments (Fig. 13.29), whatever their conservative condition, is flat storage on a rigid support. Various materials can be used to make the support. If acid-free cardboard is not available, common, appropriately coated materials can be used. For a list of possible options, see the table at the end.





**Fig. 13.27** Facsimile of a wrapped textile with loosely knotted tulle band. (Image Valentina Turina)

To protect them from contact with water, we can use aluminium or perforated polyethylene film. An alternative is to create a shape with foam, thus making a small box (Fig. 13.30), which will then be covered with perforated polyethylene or aluminium.

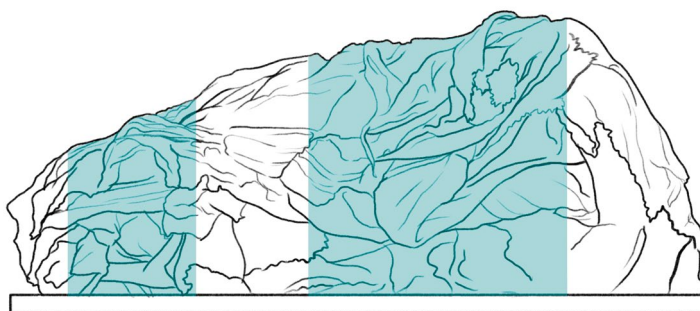
#### ***13.4.5 Textile with Oblong Shape (e.g. Bandages)***

For this type of fabric, whatever their conservation condition, the rolling method can be used (Fig. 13.31). The best way to avoid potential folds is to create a soft pad to serve as a support, of a size appropriate to the dimensions of the object.

In the case of poor conservation conditions, where the perimeter areas are fragmentary, a cotton fabric can be placed over the most degraded areas before rolling. This separates the different layers and also acts as a support.

Never leave small rolled textiles uncovered: store them inside a box with a lid. Boxes made of acid-free cardboard, polypropylene, or polyethylene are commercially available. Alternatively, you can make them with corrugated sheets of polypropylene or polyethylene.



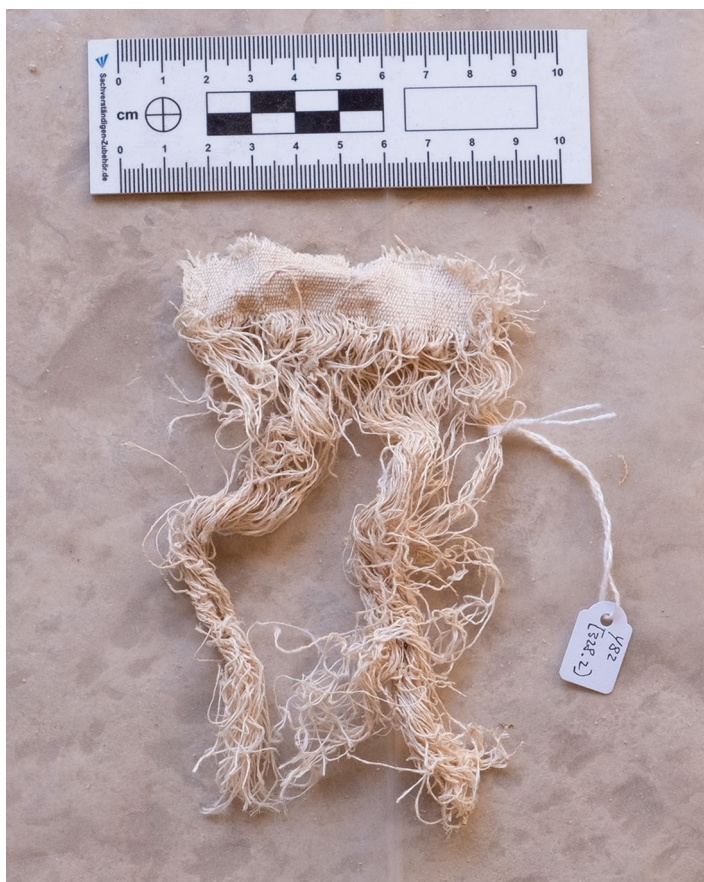


**Fig. 13.28** Positioning diagram of two containment bands around textile S.14411 (Museo Egizio, Turin), fixing the textile layers during movement or storage. (Image Valentina Turina)

### ***13.4.6 Conservation Strategies for Textiles Stored with the Body***

The approach differs depending on whether the textile wrappings remain in their original location, such as on top of the body, or whether it is worn by the deceased. Preservation and storage procedures differ significantly, starting with initial handling operations, taking into account the need to work on a set of heterogeneous finds (i.e. textiles and human remains).

The safe transportation of the wrapped body to the storage area is the primary concern. It is important to note that the handling of the artefact poses a significant risk of displacement and loss of the original stratigraphy or small fragments, including both textiles and anthropological material. This risk is particularly high when handling the body in an open environment with exposure to air.



**Fig. 13.29** Textile fragment from Saqqara (context 328, 2022 mission). (Image Valentina Turina/Leiden-Turin Expedition to Saqqara)

Therefore, it is crucial to prioritize the study of the artefact during the initial stage. In this case, it is important to carefully examine the relationship and position of the different layers, including the body, bandages, shrouds, and any other artefacts present in the wrapping assemblage.

After assessing the condition and location of the accompanying textiles, it is important to consider securing the body. A temporary “case” should be found to secure both the body and the textiles during handling (cf. Fig. 13.7). We suggest using restraining bands made of tulle, which provide a slight stress on the inside of the wrappings and allow for the temporary securing of the different layers (Fig. 13.32).

Simultaneously with the installation of the band system, a sturdy support must be inserted to withstand the weight of the body and fabrics. The selection of the support should be based on three criteria: strength, rigidity, and lightness. Strength is essential to support the substantial weight of the body and fabrics. A firm support



**Fig. 13.30** Small box made of foam, storing beaded textile S16939, Gebelein. (Image Museo Egizio, Turin)



**Fig. 13.31** Examples of textile bands (wrapping bandages) from Saqqara (context 321, 2022 mission). (Image Valentina Turina/Leiden-Turin Expedition to Saqqara)

adheres better to the wrapping, preventing flexing during handling. Additionally, a lightweight support reduces the overall weight to be moved, making handling easier. An effective solution that meets these requirements is an aluminium honeycomb panel or board, which is readily available and resistant to rust.

During the handling phases, the most critical moment is the insertion of the different materials, such as the rigid board, Melinex® sheeting, and containment band,



**Fig. 13.32** Diagram of a mummy wrapped with five shrouds (the mummy’s body is shown in orange colour). Two containment bands fix the textile layers during movements and storage. (Image Valentina Turina)

under the complete body and all its textiles. The area underneath the body is the most difficult to assess from a conservation point of view, and it is also the area most vulnerable to degradation and therefore loss of organic material. To facilitate this process, a siliconized Melinex® sheet can be slipped underneath. This does make it easier to insert the containment strips and rigid support afterwards.

Supplies and tips for the storage of textile in the field/in excavation magazine<sup>16</sup>

	Type of material	Pre treatment	Performance	Cost	Limitations and recommendations
Fabrics	Undyed Cotton sheeting	Machine wash (60°) with detergent	1 2 3 4 5	€€	It requires a treatment that cannot be carried out on the excavation. Cumbersome.
	Cotton tape		1 2 3 4 5	€	
	Tulle Polyester net		1 2 3 4 5	€	Take rolls 20–30 cm high. They are easier to transport to the excavation and have the right size to create containment bands.
Paper Products	Acid free paper	—	1 2 3 4 5	€€€	Tears easily—avoid as a support under large shrouds
	Acid free cardboard	—	1 2 3 4 5	€€€	
	Acid free cardboard tube	—	1 2 3 4 5	€€€	Difficult to find large diameters.

(continued)

<sup>16</sup>For an update on new tested materials we recommend *The Conservation and Art Materials Encyclopedia Online (CAMEO) Main Page – CAMEO (mfa.org)* or the conservation material data-base Preserv’Art <https://preservart.ccq.gouv.qc.ca/index.aspx> (both consulted on 27/03/2024).

	Type of material	Pre treatment	Performance	Cost	Limitations and recommendations
Plastics	Mylar® Polyester film	—	1 2 3 4 5	€€€	
	Coroplast® Polypropylene	—	1 2 3 4 5	€€	It does not hold excessive weight because it flexes—Do not use under mummies as support.
	Tyvek ® Polyolefin	—	1 2 3 4 5	€€€	It creates a slight friction. Do not use on painted textiles or fabrics with materials that you want to maintain.
	Polyethylene film	—	1 2 3 4 5	€	Always make small holes to allow breathability.
	Polyethylene FOAM Volara® Plastazote® Ethafoam ®	—	1 2 3 4 5	€€€	
	Polyester padding	—	1 2 3 4 5	€	
	UBS tube	wash with water and detergent	1 2 3 4 5	€€	
	SONO tube	wash with water and detergent	1 2 3 4 5	€€	
	Aluminium foil		1 2 3 4 5	€	
	Aluminum dashboard		1 2 3 4 5	€€	

N.B.: The editors recognize that many of these materials need to be brought to the field, sometimes from abroad. Suppliers can also vary considerably from one country to the other, with more and more products available online. For that reason, we chose not to quote specific suppliers or online retailers. Contacting your national conservation centre or school is often a good place to start!

**Funding Information** Parts of the present research and open access funded by the European Union (ERC Fashioning Sudan, 101039416). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Council. Neither the European Union nor the granting authority can be held responsible for them.



## Selected Bibliographical References (Organised by Themes)

### *Textiles and Funerary Practices*

- Bizot, B., & Signoli, M. (Eds.). (2009). *Rencontres autour des sépultures habillées. Actes des journées d'étude organisées par le Groupement d'Anthropologie et d'Archéologie Funéraire et le Service Régional de l'Archéologie de Provence Alpes-Côtes d'Azur* (Carry-le-Rouet, 13–14 Décembre 2008). Gap.
- Bonnabel, L., & Carré, F. (Eds.). (1996). *Rencontre autour du linceul. Compte-rendu de la journée d'étude organisée par le G.A.A.F.I.F et le Service Régional de l'Archéologie de la Haute Normandie* (Paris, le 5 avril 1996). G.A.A.F.I.F. Bulletin de liaison numéro spécial. Reims.
- Duday, H. (2009). *The archaeology of the dead: Lectures in archaeoethnology*. Oxbow Books.
- Duday, H., Courtaud, P., Crubezy, É., Sellier, P., & Tillier, A.-M. (1990). L'Anthropologie « de terrain »: reconnaissance et interprétation des gestes funéraires. *Bulletins et Mémoires de la Société d'anthropologie de Paris, Nouvelle Série* Tome 2 fascicule 3–4, pp. 29–49.
- Gleba, M. (2016). Wrapped up for safe keeping: 'Wrapping' customs in early Iron Age Europe: Archaeological and anthropological perspectives. In S. Harris & L. Douny (Eds.), *Wrapping and unwrapping material culture, archaeological and anthropological perspectives. Institute of Archaeology Publication 64* (pp. 135–146). UCL.
- Ikram, S., & Dodson, A. (1998). *The mummy in Ancient Egypt: Equipping the dead for eternity*. Thames and Hudson.
- Grömer, K., & Grassberger, M. (2018). Organic remains from archaeological contexts. Forensic taphonomy applied to prehistoric and early medieval inhumation graves. *Neues Jahrbuch für Geologie und Paläontologie*, 289(2), 203–216.
- Harris, S. (2014). Wrapping and unwrapping the dead: the Bronze Age mound burials of Southern Scandinavia through a wrapping analysis. In S. Harris & L. Douny (Eds.), *Wrapping and unwrapping material cultures. Archaeological and anthropological perspectives. Institute of Archaeology Publication 64* (pp. 115–134). UCL.
- Peressinotto, D., Maureille, B., Lecoine, Y., & Geus, F. (2001). Reconstitution de gestes funéraires, le linceul de la tombe 176 de la nécropole Nord de l'île de Saï (Province du Nord, Soudan). *Bulletins et Mémoires de la Société d'Anthropologie de Paris*, 13(1–2), 127–141.
- Yvanez, E. (2023). Textiles in the funerary chaîne opératoire. Perspectives from Meroitic and Postmeroitic Sudan and Nubia (c.350 BCE–550 CE). *Journal of African Archaeology*, 21(2), 154–179.

### *Textile Research in General, Analysis and First-Aid*

- Andersson Strand, E. (2012). The textile chaîne opératoire: using a multidisciplinary approach to textile archaeology with a focus on the ancient Near East. *Paléorient*, 38(1–2), 21–40.
- Andersson Strand, E., Frei, K. M., Gleba, M., Mannering, U., Nosch, M. L., & Skals, I. (2010). Old textiles—New possibilities. *European Journal of Archaeology*, 13(2), 149–173. <https://doi.org/10.1177/1461957110365513>
- Andersson Strand, E., & Nosch, M. L. (Eds.). (2013). *Textile production and consumption in the Ancient Near East (Ancient Textile Series 12)*. Oxbow Books.
- Cruikshank, P., Harrison, A., & Fields, J. (2002). From excavation to display: The conservation of archaeological textiles from an AD first-third century cemetery site in Jordan. *The Conservator*, 26, 44–55.
- Emery, I. (1994). *The primary structures of fabrics*. Thames and Hudson: The Textile Museum.



- Gillis, C., & Nosh, M.-L. (2007). *First aid for the excavation of archaeological textiles*. Oxbow Books.
- Harlow, M., & Nosch, M. L. (2014). Weaving the Threads: Methodologies in textile and dress research for the Greek and Roman world—State of the art and the case for cross-disciplinarity. In M. Harlow & M. L. Nosch (Eds.), *Greek and Roman textiles and dress (Ancient Textile Series 19)* (pp. 1–15). Oxbow Books.
- Harrison, A., & Smalley, R. (2017). The care, conservation and study of archaeological textiles from Jordan and Sudan, with particular reference to the Fourth Nile Cataract mummies. In A. Moor, C. Fluck & P. Linscheid (Eds.), *Excavating, analysing, reconstructing textiles of the 1st millennium AD from Egypt and neighbouring countries. Proceedings of the 9th conference of the research group 'Textiles from the Nile Valley'*. Tiel, Lanoo, p 120–141.
- Margariti, C., & Loukopoulou, P. (2016). Storage solutions for excavated textiles tending to their recalcitrant behaviour. *Journal of the Institute of Conservation* 39(2): 145–157. <https://doi.org/10.1080/19455224.2016.1212718>
- Peacock, E. (2003). Il deterioramento biologico delle fibre tessili in contesti archeologici implicazioni per le scelte di conservazione. In C. Dal Ri & L. Moser (Eds.), *Intrecci vegetali e fibre tessili da ambiente umido Analisi Conservazione e Restauro. Incontri di Restauro 4* (pp. 11–31). Trento.
- Ryder, M. L. (2000). Issues in conserving archaeological textiles. *Archaeological Textiles Newsletter*, 30, 2–8.
- Skals, I. (1996). From grave to showcase: Modern care for ancient textiles. In A. Roy & P. Smith (Eds.), *Archaeological conservation and its consequences* (pp. 162–165). International Institute for Conservation Preprints.
- Ulanowska, A., Grömer, K., Vanden Berghe, I., & Öhrmann, M. (Eds.). (2022). *Ancient textile production from an interdisciplinary approach: Humanities and natural sciences interwoven for our understanding of textiles, interdisciplinary contributions to archaeology*. Springer.
- Walton, P., & Eastwood, G. (1983). *A brief guide to the cataloguing of archaeological textiles*. Institute of Archaeology.

## ***Textile Archaeology in Egypt and Sudan***

- Adams, N. K. (2010). Political affinities and economic fluctuations: The evidence from the textiles at Qasr Ibrim. In W. Godlewski & A. Laitar (Eds.), *Between the cataracts. Proceeding of the 11th International Conference for Nubian Studies, Warsaw University. PAM supplement series 2* (pp. 291–297). Warsaw.
- Bender Jørgensen, L., & Mannering, U. (2001). Mons Claudianus: Investigating Roman textiles in the Desert. In P. Walton Rogers, L. Bender Jørgensen, & A. Rast-Eicher (Eds.), *The Roman Textile Industry and its influence. A birthday tribute to John Peter Wild*. Oxbow Books.
- Bergman, I. (1975). *Late Nubian Textiles, Scandinavian Joint Expedition 8*. Scandinavian University Books.
- Dickey, A. (2022). EDS analysis of Neolithic to Early Dynastic Egyptian woven cloth in the Bolton Museum collection. In A. Dickey, M. Gleba, G. Longhitano, & S. Hitchens (Eds.), *Exploring ancient textiles: Pushing the boundaries of established methodologies, Ancient Textiles Series 40* (pp. 93–109). Oxbow Books.
- Hallman, A. (2015). Textiles from Tomb II in Deir el-Bahari: preliminary report from season 2012/2013. *Polish Archaeology in the Mediterranean*, 24(1), 247–256.
- Mayer-Thurman, C. C., & Williams, B. (Eds.). (1979). *Ancient Textiles from Nubia: Meroitic, X-Group and Christian fabrics from Ballana and Qustul*. Art Institute of Chicago.
- Mossakowska-Gaubert, M. (Ed.). (2020). *Egyptian textiles and their production: 'word' and 'object'*. Zea E-Books Collection 86. <https://digitalcommons.unl.edu/zeabook/86>

- Rooijakkers, T. (2005). Unravelling Beni Hasan: Textile production in the Beni Hasan tomb paintings. *Archaeological Textiles Newsletter*, 41, 2–13.
- Spinazzi-Lucchesi, C. (2022). Textile production in Deir el-Medina: A hidden activity. In C. Greco, S. Töpfer, P. Del Vesco, & F. Poole (Eds.), *Deir el Medina Through the Kaleidoscope: Proceedings of the International Workshop Turin 8th–10th October 2018* (pp. 493–501). Museo Egizio.
- Vogelsang-Eastwood, G. (1992). *The production of linen in pharaonic Egypt*. Textile Research Centre.
- Wild, J. P., & Wild, F. C. (2014). Qasr Ibrim: New perspectives on the changing textile cultures of Lower Nubia. In E. R. O'Connell (Ed.), *Egypt in the First Millennium AD. Perspectives from new field work, British Museum Publications on Egypt and Sudan 2* (pp. 71–80). Peeters.
- Wozniak, M. M., & Czaja, B. (2020). Medieval Nubia: Contribution to the study of textiles from Meinarti. *Archaeological Textiles Review*, 62, 45–55.
- Yvanez, E. (forthcoming) Wrapping the dead in Meroitic Sudan. In E. Yvanez, L. Ørsted Brandt, & M. Borla (Eds.), *In Textile Layers. Wrapped human remains, animals and artefacts along the Nile Valley*. BAR International Series, Oxford.
- Yvanez, E., & Wozniak, M. M. (2019). Cotton in ancient Sudan and Nubia: Archaeological sources and historical implications. In C. Bouchaud & E. Yvanez (Eds.), *Cotton in the Old World: domestication, cultivation, use and trade, Revue d'Ethnoécologie 15*. <https://doi.org/10.4000/ethnoecologie.4429>
- Yvanez, E., Murillo, M. L., Francigny, V., & de Voogt, A. (2021). Cultural interconnections: Textile craft and burial practices in Early Medieval Sudan. *Archaeological Textiles Review*, 62, 32–44.

## Natural Science Analyses Applied to Textiles

- Bergfjord, C., & Holst, B. A. (2010). Procedure for identifying textile bast fibres using microscopy: Flax, nettle/ramie, hemp and jute. *Ultramicroscopy*, 110(9), 1192–1197.
- Dyer, J., Tamburini, D., O'Connell, E. R., & Harrison, A. (2018). A multispectral imaging approach integrated into the study of Late Antique textiles from Egypt. *PLoS One*, 13(10), e0204699. <https://doi.org/10.1371/journal.pone.0204699>
- Garside, P., & Wyeth, P. (2006). Chapter 4: Textiles. In E. May & M. Jones (Eds.), *Conservation science. Heritage materials* (pp. 56–91). The Royal Society of Chemistry.
- Nowik, W., Desrosiers, S., Surowiec, I., & Trojanowicz, M. (2005). The analysis of dyestuffs from first to second century textile artefacts found in the Martres-de-Veyre (France) excavations. *Archaeometry*, 47(4), 835–848.
- Ørsted Brandt, L., Schmidt, A. L., Mannering, U., Sarret, M., Kelstrup, C., Olsen, J. V., & Cappellini, E. (2014). Species identification of archaeological skin objects from Danish bogs: Comparison between mass spectrometry-based peptide sequencing and microscopy-based methods. *PloS One*, 9(9), e106875. <https://doi.org/10.1371/journal.pone.0106875>
- Ørsted Brandt, L., & Allentoft, M. E. (2019). Archaeological wool textiles—A window to ancient sheep genetics? In S. Sabatini & S. Bergerbrant (Eds.), *The textile revolution in Bronze Age Europe. Production, specialisation, consumption* (pp. 274–303). Cambridge University Press.
- Plowman, J. E. (2018). Proteomics in wool and fibre research. In A. de Almeida, D. Eckersall, & I. Miller (Eds.), *Proteomics in domestic animals: From farm to systems biology* (pp. 281–297). Springer. [https://doi.org/10.1007/978-3-319-69682-9\\_14](https://doi.org/10.1007/978-3-319-69682-9_14)
- Rast-Eicher, A. (2016). *Fibres. Microscopy of archaeological textiles and furs*. Archaeolingua.
- Solazzo, C. (2019). Characterizing historical textiles and clothing with proteomics. In A. Serrano, M. J. Ferreira, E. C. de Groot, & A. J. Cruz (Eds.), *Studies in historical textiles. Conservar Património 31* (pp. 97–114). <https://doi.org/10.14568/cp31>

- Solazzo, C., Dyer, J. M., Clerens, S., Plowman, J., Peacock, E. E., & Collins, M. J. (2013). Proteomic evaluation of the biodegradation of wool fabrics in experimental burials. *International Biodeterioration and Biodegradation*, 80, 48–59.
- Van den Berghe, I., Gleba, M., & Mannering, U. (2009). Towards the identification of dyestuffs in Early Iron Age Scandinavian peat bog textiles. *Journal of Archaeological Science*, 36, 1910–1921.
- Viñas Caron, L., & Ørsted Brandt, L. (forthcoming). Cloth-omics: A guideline to understand methodologies, perspectives, and practicalities of natural sciences in textile and leather research. In C. Margariti, H. Lukesova, & F. Gomes (Eds.), *Advanced analytical techniques for heritage textiles. Heritage science*. Springer.
- Wozniak, M. M., Witkowski, B., Ganeczko, M., Gierczak, T., & Biesaga, M. (2021). Textile dyeing in Medieval Sudan evidenced by HPLC-MS analyses: Material traces of a disappeared activity. *Journal of Archaeological Science: Reports*, 38, 103098.
- Wozniak, M. M., & Belka, Z. (2022). The provenance of ancient cotton and wool textiles from Nubia: Insights from textile technical analysis and Sr isotopes. *Journal of African Archaeology*, 20(2), 202–216.

**Elsa Yvanez** is an archaeologist specialised in the textile production of ancient Sudan and Nubia, in the chaîne opératoire and economic significance of spinning and weaving, as well as in the use of textiles for clothing and burial. After a Marie-Skłodowska Curie fellowship (TexMeroe, MSCA 743420), she conducted the Unravelling Nubian Funerary Practices project at the Polish Centre of Mediterranean Archaeology, University of Warsaw. She is currently employed as an associate professor at the Centre for Textile Research/Saxo institute, at the University of Copenhagen, where she is leading the 5-year research project Fashioning Sudan. Archaeology of dress practices along the Middle Nile (ERC StG 101039416). In parallel, she is also acting as a textile specialist for several excavation teams working in Egypt. She is member of EuroWeb's working group 1 (Textile technologies) and 2 (Clothing Identities).

**Valentina Turina** is a senior conservator qualified by the Italian Ministry of Cultural Heritage, with a specialization in textile artworks. She is currently based at the Fondazione Museo Egizio di Torino, working as a conservator in the Collection, Research and Education Department. She focusses her research on the conservation of Pharaonic and Late Period Egyptian textiles, as well as on storage strategies, and also intervenes in excavation projects.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.



# Glossary of Terms Relative to Funerary Textiles in Archaeology

Since the very beginning of our discussions during the workshop and in the making of this book, the editors have noted the use of many different words to refer to textiles found in funerary contexts. In addition, the exact same word can have different nuances and interpretations depending on the native language and background of the author, as well as different meanings when applied to various geo-historical spheres. We therefore thought it is useful to group some of these recurring words into a short glossary. Our objective was not to unify a fixed terminology applicable to all funerary textiles, as this would erase the diversity of vocabulary of each author/background/sub-field. This glossary is also—by no means—exhaustive. We however hope to provide a first survey of useful terms to help in the description of funerary textiles.

The study of textiles, as many other areas of material culture, implies to distinguish the artefact—as recovered during archaeological fieldwork—from their usage during the funerary process. In our case, the artefact is a textile, which could be used for different purposes, such as body support\*, wrappings\*, clothing\* the body, etc. Its primary function at the time of its manufacture can be completely obscured by many phases of reuse, until the textile finally joins the body in the grave. Depending on the words we choose, we can position our description at different interpretative levels: the words textile, cloth\*, or fabric are neutral descriptors focusing on material aspects; while the words clothes\*, shroud\*, or dress\*/attire\* bear an interpretation about the textile's usage in the grave. The common use of the word shroud\* can also hide specific meanings and practices that depend on local religious practices. It is also very important to underline the fact that many functions could be filled by different types of cloth-type material\*, including non-woven fabrics and animal skin processed in many different ways. Finally, we have noted in the literature that functions during life and during death are sometimes blurred: textiles are identified as a specific type of garment\* without mention of it being worn by the dead (as in life) or wrapped around them (reused as a shroud\* or wrapping); or textiles are

strictly categorized as either garments or wrappings, removing all aspects relative to funerary reuse. Therefore, it seems useful to dissociate the artefact itself from its role during the funerary practices that generated its use in the grave. Both are essential components but need to be considered in stages. We recommend to keep initial descriptions to a lower interpretative level (based on the material object) until detailed analyses of the archaeological context and textile data can bring more information and clarify the textiles' functions.

For this reason, we have chosen to divide the glossary into two parts: one that lists basic terms to describe archaeological textiles; and one that proposes a range of their different functions in the grave. It is important to note that functions are often multi-layered concepts, with many textile objects going from one category of use to the other, depending on people's changing daily-life needs. As a precious commodity, textiles were also reused and repurposed. Clearly identifying the function of any textile artefact, *a fortiori* when found associated with a burial, is therefore quite difficult, and caution should be exercised if you deem it important. However, that is a pretty standard practice in glossaries, so it might not be absolutely necessary.

## Descriptive Terms for Archaeological Textiles

**Cloth** Broad term to refer to a group of materials made from interworked threads\* including woven textiles, nonwoven cloth such as looped cloth, and interworked fibres including felted wool and bark cloth. Non-woven cloth or non-loom textiles refer to a cloth made by any means other than weaving and are commonly used to refer to fibres worked into a mesh (such as felt or bark cloth), crochet, knitting, netted and looped cloth. Strictly, textiles, or woven textiles, originates from the Latin *texere*, 'to weave'\*, and indicates that the item has been woven on a loom. [Definition S. Harris, in Harris 2008: 225, reproduced with permission]

**Cloth-Type Materials** Inclusive classification of textiles, cloth\*, and skins, providing a fresh way to frame the relationship between these materials. From this perspective, cloth-type materials are seen as coexisting and related in their potential use, yet contrasting in the way they are made and perceived in their context. Cloth and skins are both sheets of material characterized by their flexibility, being thin, floppy, and malleable. They can be solid and continuous or with holes between binding points, e.g. various types of nets, lace, or looping. The relative thinness of these sheets is highly significant and relates to its ability to be wrapped, folded and shaped, making cloth-type materials a very frequent partner of both bodies and things. [Definition S. Harris, in Harris 2008: 224–225, reproduced with permission]

**Dress Complements (Non-Textile)** In funerary contexts, it is important (but not always easy) to establish a differentiation between adornment elements in general and those elements which can better be described as dress\* complements. These can include elements produced with different raw materials, most notably metal (bronze, gold, silver, etc.), but also, for example, stone, bone/ivory, and wood. Despite having

an ornamental function, these components are directly connected to the functioning of the attire\* itself (e.g., buttons and other fastenings). It should however be acknowledged that the boundary between dress complements and adornments can, in some cases, be blurry, namely in the case of non-textile elements used as embellishments (e.g. decorative gold discs). [F. Gomes]

**Edges** Outside borders of the cloth\*. When weaving a textile on a loom, the edges are the borders that line the rectangular fabric in construction. Transverse edges are the superior and inferior borders, sometimes, depending on the type of loom used, called starting and finishing borders. When the textile is on the loom, these transverse edges are the horizontal ones, at the top and bottom of the fabric. The starting edge is where the warp threads turn back; it is often woven especially off the loom. On the contrary, the lateral edges are the vertical sides positioned along the left and right border of the fabric. It is where the weft threads turn back. To avoid confusion, they are called selvages.

**Fabric Imprint** Negative trace of a textile, showing as a slight depression or three-dimensional mark of the weave\* structure, imprinted on a malleable material such as clay or mud layer, as well as skin. Such imprints can be visible on the reverse of sealings or on containers made of ceramic and copper alloy, as well as the ground of a grave cavity. They can also be recognised on human remains, especially in the case of a tightly-wrapped body, on protruding body parts such as the forehead, shoulders, elbows, and knees.

**Fastenings** The term *fastening(s)* refers to parts of a system used to hold together at least two pieces (or two sections of a piece) of fabric (e.g. buttons and fibulae/brooches). It can also be used to name different features used to close, tighten, and adjust binding elements, such as belts and sashes\*, used to support, adjust or cinch garments\* (and possibly also wrappings\*) (e.g., belt buckles and plaques). [F. Gomes]

**Fibre** Fine filament or substance of animal, plant, or mineral origin, susceptible to be spun into a thread\*. Some common archaeological fibres include wool, flax, cotton, and silk, but many other wild and domesticated plant and animal species have been used for the manufacture of textiles. Fibres need to be extracted (from plants or silk cocoons, for example) or harvested (from an animal fleece) and processed according to different methods before spinning. They are, in effect, the raw material of any textile.

**Funerary Container or Disposal Container** The word *container* is taken from the work conducted by American anthropologist Roderick Sprague and applies to 'any container or vehicle used to hold the [human] remains in either a primary or final disposal' (Sprague, 1968: 480). Across the world, there is an infinity of material that can fill this function. Archaeological and ethnological examples include urns, blankets\*, bark wrappings, hollow logs, huts, animal hides and skins, wooden



coffins, stone boxes and cysts, cremation bassins, boats, baskets, large jars, etc. Several layers can be combined in a succession of different materials, e.g. a body wrapped in a blanket and deposited in a coffin. Sprague differentiates funerary containers from forms of body preparation, which covers various treatments of the dead body prior to its deposition, such as cleansing, embalming, removal of viscera, anointment, dressing\*, and wrapping\* the body. Because they involve the manipulation of the dead and textiles, the last two categories show how fluid the division between body preparation and body disposal can be. In the case of Pharaonic mummification for example, the textile wrappings are both a mode of body preparation (belonging to complex embalming rites) and a type of body container.

**Mummy** A mummy is the body of a dead human or animal, whose soft tissues have been preserved by dehydration so it does not decay further if kept in dry conditions. Mummification can occur as a natural phenomenon, when the body was exposed to extreme cold, very low humidity, or lack of air. This can be accidental or intentionally chosen by the community. Mummification can also be deliberate, such as the Pharaonic mummies, in which case a complex embalming process proceeded to the drying of the body in natron, the extraction of viscera, the application of bactericide substances, and the wrapping\* of the body in numerous textile layers. In many ways, the ancient Egyptian embalming techniques enhanced the natural mummification that occasionally occurs when a body is buried and left undisturbed in the dry sands of the desert. Either natural or artificial, a mummy is often preserved with cloth-type materials\* that formed the whole ‘body bundle’, and is therefore a composite entity—biological and material.

**Seam** A line of stitches that join two pieces of cloth-type material—usually textile or leather—by sewing.

**Thread** A group of fibres\* twisted together, or a filamentous length formed by spinning and twisting short textile fibres\* into a continuous strand. The threads can be ‘simple’—composed of only one length—or plied, when several lengths are twisted together. Fibres (and threads) can be twisted in clockwise direction (Z-spun) or counter-clockwise (S-spun). During weaving, threads are organized in two systems: the vertical system, called the warp, and the horizontal system, called the weft. The interlacing of these two thread systems forms the weave\*.

**Thread Count** One of the characteristic traits of a weave\* is the thread count, i.e. the number of threads in each system per cm square (expressed as e.g. 9 warps / 12 wefts per cm). Combined with other data, such as the diameter of the threads, this value indicates if the weave is dense with a high coverage or loose and more see-through.

**Weave/Weaving** Mode of interlacing the weft threads and the warp threads\*, the last being attached to the loom and put under tension. Weaving follows pre-established methods and rules, so the repetition of the interlacing of threads creates

the textile. Different types of looms have given rise to different techniques and results, visible on the finished textile by variations in textures, patterns, edges, and overall feel.

## Categories of Function

**Bandages (bandelettes in French, sometimes used in English as well)** Commonly-used term to refer to a strip of cloth used for the purpose of wrapping a mummy. Woven on purpose as a long band or made from repurposed fabric, torn to the desired length and width (cf. binding tapes\*).

**Belts/Sashes** Category of garments referring to a band of cloth-type materials worn around the waist or across the torso. In archaeological textile research, the presence of belts or sashes is often recognised through the identification of 'belt buckles'. While in common speech different types of fastening\* elements for binding garments\* are identified as 'belt buckles', this designation could arguably be restricted to fastenings of (semi-)rigid belts (i.e. made of leather or similar materials). Other pieces included in this broad category could also be used to fasten more flexible, textile binding elements, which could more aptly be characterized as sashes. In both cases, it is possible to detect the presence of the original garment through the fastenings\* and sometimes tenuous traces of textile or skin, preserved in the metal's corrosion layers. [F. Gomes]

**Bier Cloth** A large cloth placed on top of a bier, which was a flat, usually wooden frame or board on which the dead were placed. The bier cloth can also sometimes be called a shroud\* or a draping cloth. [M. Siennicka]

**Binding Tapes/Cords** Strips of cloth, narrow 'ribbons', or cords used to bind the limbs of the deceased and/or to maintain the wrapping textiles in place. They can be made with torn reused fabrics, or woven as narrow ribbons (see bandages\*), as well as woven, braided, or knotted cords. Thin strings can also be grouped and used as cords. Bindings can be of different materials: threads of plant or animal fibres, textile, twisted plant fibres, tendons, leather or animal skin...etc.

**Blanket** Term frequently used to refer to a large piece of cloth-type material\* primarily used for warmth. It can be used as a sleeping cover, as a sleeping surface, or as a body wrap. It is commonly understood as a textile of thick and soft texture, often created with weaving techniques incorporating extra threads. These techniques result in three dimensional textural effects and improve the heat retention of the final product. Because of technical similarities, blankets have often been referred to as 'rugs' in the literature, and it is possible that the same pieces were in fact used for both functions. In the grave, blankets can be laid on the ground (as a body support\*), placed on top of the body, or wrapping it entirely.

**Body Support** Surface placed underneath the body of the deceased. Can be made of rigid material (e.g. a wooden board, cf. bier\*, or the bottom of coffins) or of more flexible materials and construction. Such semi-flexible structures can include bed-like frames—a wooden frame filled with a woven surface of animal skin or plant fibre strips; or semi-rigid animal hides and plant fibre mats. Body supports can also be completely pliable, made of cloth-type materials\* such as tanned leather, animal fur, and thick textiles (e.g. rugs or blankets\*). Sometimes, addition of a supplementary textile and/or a head rest—used in the inhumation as a pillow for the deceased—can be observed, in which case we can assimilate the body support with a funerary bed.

**Clothes/Clothing** Items worn to cover parts of the body. Clothing can be made of an infinite variety of cloth-type materials\*, including textiles, animal skin, and many other thin sheets of material and natural products found in the environment. Clothing is usually divided into different categories corresponding to the specific body area that they cover or wrap: garments\* cover the body; footwear covers the feet; gloves cover the hands; headgear covers the head, etc. The amount and type of clothing varies greatly across historical periods and geographical regions, depending on a myriad of environmental and socio-cultural factors. In the grave, clothes can sometimes be worn by the deceased, i.e. to dress\* or enclose the body as they did in daily life. This is, however, not systematic: many items of clothing can be repurposed to fill different functions. For example, large clothes such as tunics and mantles can be used as body wrappings\*. It is therefore very important to distinguish these two different phases of use in the description, with appropriate terms.

**Dress/Dressing** *Dress*, *dressing*, and *dress practices* are terms used in similar ways to clothing\*, sometimes including more specifically garments. To get dressed is to cover one's body in clothing. However, the term *dress practices* carries the additional meaning of being an assemblage of different items of clothing\*. In that broader sense, dress practices include other types of body transformation that impact on people's appearance, such as hair styles, skin modification (make-up, tattoos, scarification, etc.), piercings and other permanently-worn personal ornaments, portative personal accessories, and every kind of jewellery. The relationships between these individual artefacts and elements are an intrinsic part of *dress practices*.

**Envelope** Term sometimes used to describe body wrappings\*, usually designating the full coverage of the entire body. Like wrappings, body envelopes can be made of one item of cloth-type material or several, and arranged in diverse ways. The same use can also be designated as cover, sheath, wrapper, or wrapping.

**Funerary Attire** Refers to the dress\* worn by the deceased during the funerary rites (whether these involved the cremation or inhumation of the body). Funerary attire comprises both garments\* and non-textile dress complements\*. It is not necessarily a one-to-one reflection of the garments worn in life, as it played an important

role in the highly symbolic context of burial rites and therefore answered to practical contingencies and socio-cultural imperatives relative to death. Still, funerary attire can give us good indications on the existence of shared (or differentiated) fashions, understood as languages of power, status, and identity. [F. Gomes].

**Garments** Single items of clothing\*, functioning as outer covering for the body and contributing to its outward appearance. Garments comprise an infinite repertoire of forms, materials, and functions. They can be simple in their composition (e.g. a rectangular piece of textile wrapped in various ways around the body, taken directly off the loom without further modification); or composed of different parts, cut and sewn together. They can be made of many different types of cloth-type material\*: woven or non-woven textiles, animal skins, non-textile dress components\* such as applied ornaments, or fastenings\* made of metal, shells, mica, stone, faience, etc. Together with other body industries and personal ornaments, their assemblage forms dress practices\*.

**Padding** Textile or over cloth-type material\* (e.g. fibres) agglomerated or folded to form a three-dimensional mass. It can be placed around the body (in the case of mummification, sometimes inside the body itself) to help recreating a specific shape. It can also be placed between the body and the wrapping layers, in effect ‘stuffing’ the body bundle to add extra volume in specific areas.

**Pall** Cloth\* spread over a coffin (cf. bier cloth\*) or a tomb during the funeral. The use of this term tends to be specifically applied to European and Christian contexts, especially for the post-medieval periods. There, the pall is taking part in the liturgy of the funeral—the ceremonies and rites—and is not necessarily placed in the tomb with the dead.

**Sheet (sometimes even bedsheet/winding sheet)** This term has been commonly used in the past to refer to large and thin rectangular pieces of cloth\* used to entirely wrap human remains. It conveys the idea of reuse and is often used interchangeably with shroud\*. The expression *winding sheet* clearly indicates that their large size and pliable nature allowed to turn completely and repeatedly around the body.

**Shroud** The word *shroud* is particularly problematic. Its definition in modern English dictionaries reveals its polysemy: the Cambridge Dictionary defines it as ‘a cloth or long, loose piece of clothing that is used to wrap a dead body before it is buried’ while the Merriam-Webster makes it ‘a burial garment’, ‘something that covers, screens, or guard’. We are therefore left with a blurry and at times contradictory definition. Is a shroud a special garment\*? A large piece of cloth\*? Is it made exclusively for funerary use or is it a reused item? Is it dressing\* or wrapping\* the body? Archaeological literature offers examples of each, using *shroud* as a synonym of many other terms listed in the present glossary. In fact, a *shroud* can take many different forms depending on the socio-cultural and geo-historical area under study. R. Sprague’s burial terminology places the *shroud* in both categories of ‘body

preparation' and 'disposal container\*' (Sprague, 2005: 70, 124–128). It is also important to note that, despite the seemingly neutral definitions accepted in both general and archaeological languages, the word *shroud* has specific connotations in the mind of modern and often Western academics, inherited from the religions of the Book. Its common and often subconscious representation is a white cloth\* with minimalist manufacturing techniques and appearance. It is therefore important to precisely define and describe each find, the artefact itself as well as the way it was placed on or around the body. To avoid misunderstandings and misrepresentation of the archaeological realities, the term wrappings\* have been preferred in many contributions of the present volume.

**Wrappings/Body Wrappings** The generic term *wrappings* refers to any pliable sheet of cloth-type material\* used to conceal the body, in totality or in part. Wrappings were intended to protect the deceased from view as well as offer a (temporary if not entirely symbolic) protection against environmental factors, such as insects. Wrappings can enclose the body by being wound or folded around it (cf. envelope\* and shroud\*), or cover it. They can be made of a single layer, a single item arranged in several layers, or many different items arranged in many layers. They can be loosely placed on/around the body, or maintained with bindings\*. They can also be large sheets\* or bandages\*, or an assemblage of both; as well as garments, worn by the body or reused around it.

This large semantic coverage is particularly helpful, especially when describing burials with no preserved organic material, where it is impossible to clarify the exact nature of the textiles used to bind and protect the deceased. In undisturbed inhumations lacking any preserved textiles or skin, the presence of wrappings can sometimes be ascertained through the meticulous recording of the skeleton's position.

This glossary was compiled by Elsa Yvanez, grouping terms found throughout the book and used by the different authors. Francisco Gomes and Malgorzata Siennicka also provided their own definitions. Otherwise, useful resources on the commonly accepted use of English terms were found in the online Merriam Webster Dictionary (<https://www.merriam-webster.com/>, consulted on 26-03-2024).

Methodical inspiration and several definitions were also sourced in the following:

Crubézy, É., Lorans, E., Masset, C., Perrin, F., & Tranoy, L. (2000). *L'archéologie Funéraire*. Éditions Errance.

Harris, S. (2008). Textiles, cloth, and skins: The problem of terminology and relationship. *TEXTILE*, 6(3), 222–237. <https://doi.org/10.2752/175183508X377645>

Harris, S. (2012). From the parochial to the universal: Comparing cloth cultures in the Bronze Age. *European Journal of Archaeology*, 15(1), 61–97.

Sprague, R. (1968). A suggested terminology and classification for burial description). *American Antiquity*, 33(4), 479–485.

Sprague, R. (2005). *Burial terminology. A guide for researchers*. Alta Mira Press.

# Historical Periods Index

## **B**

Bronze Age, 12, 37, 44, 69, 236, 241–245

## **G**

Graeco-Roman Period, 139–141, 143, 146, 157–159

## **I**

Iron Age, 12, 18, 32, 34, 37, 38, 41, 46, 48, 69, 253–272

## **M**

Medieval, 12, 16–18, 30, 31, 43, 48, 97–114, 119, 121, 122, 167–203, 221–230, 236, 281, 282, 339

Meroitic period, 4, 10, 279

Middle Kingdom, 13, 156, 157

## **N**

Neolithic, 236, 243

New Kingdom, 139, 157

## **O**

Old Kingdom, 139–144, 147, 157–159

Ottoman, 93, 170

## **P**

Postmeroitic period, 4

Prehistoric, 27, 28, 32, 34, 44, 48, 69, 70, 235–247



# Textile-Related Terms Index

## B

Bandage, 36, 63, 119, 182, 187, 323–326, 337, 340  
Bier cloth, 236, 244, 337  
Binding cords/tapes, 337  
Blanket, 10, 35, 56, 58, 63, 64, 67, 109, 110, 198, 199, 229, 236, 244, 305, 335–338

## C

Clothing, 1, 10, 13, 14, 30, 32–34, 40, 43–45, 47, 48, 54, 57–61, 65–69, 81, 82, 87, 93, 99, 106, 119, 123, 128, 159, 224, 228, 229, 282, 287, 303, 333  
Cotton, 10, 54, 56, 58, 62, 63, 65, 87, 104, 110, 111, 113, 118, 130, 178, 179, 188, 191, 192, 196, 198, 199, 202, 289, 311, 318–320, 322, 323, 327

## D

Dress, 27, 29–32, 34, 37, 39, 43–46, 56–58, 62–69, 94, 108, 109, 113, 139, 151, 180, 225, 254–259, 262, 265, 267, 269–272, 281, 282  
Dress complements, 259–261, 267, 269–271  
Dye, 10, 39, 60, 118, 159, 182, 188, 191–193, 199, 207, 211, 215, 216, 257, 302, 312

## E

Embroideries, 5, 35, 42, 60, 90, 111, 206, 213, 216, 217, 312

## F

Flax, 40, 56, 65, 112, 118, 137, 159, 225, 241, 257, 258, 306, 311

## G

Garment, 16, 18, 30–35, 37, 39, 43–47, 56, 58–60, 65, 66, 79–94, 113, 148, 151, 154, 158, 180, 190, 191, 195, 196, 207, 228, 261, 263, 270, 271, 297, 333  
Gold thread, 124, 176, 182, 188

## I

Imprint, 18, 28, 34, 144–146, 152, 235–247, 289

## L

Lace, 89, 101, 102, 110–113  
Linen, 13, 18, 30, 33, 37–40, 42, 56, 63, 65, 81, 87, 93, 119, 121, 122, 126, 132, 137–139, 143, 144, 146–155, 158, 178, 182, 187–189, 191, 196, 210, 216, 229, 238, 241, 242, 244, 261, 306

## P

Padding, 320, 328

## S

Seam, 30, 81, 109–111, 113, 191

Sheet, 27, 38, 40, 42, 48, 58, 59, 64, 105, 143,  
148, 149, 151, 153–155, 229, 244–246,  
296–298, 318, 320, 323, 326, 327,  
334, 338

Shroud, 14, 18, 27, 30, 35, 37, 43, 56, 58, 61,  
119–124, 126, 128, 129, 149–151, 158,  
175, 176, 178–180, 182, 183, 185, 188,  
189, 191, 192, 194–197, 202, 236,  
244–246, 263, 282, 284, 296, 305, 306,  
318–320, 326, 327, 334

## T

Tabby, 5, 18, 30, 33, 38, 42, 45, 87, 199, 207,  
208, 210, 215, 216, 221, 224–230, 240,  
244, 257, 258, 261, 312

Tapestry, 10, 11, 22, 90, 180, 182, 193, 194,  
206, 207, 209, 215, 289

Thread, 5, 10, 29, 38, 39, 42, 84, 87, 89–92,  
94, 103, 106, 123, 124, 176, 182, 188,  
194, 198, 207, 213, 214, 225–228,  
240–243, 246, 257, 258, 282, 303,  
311–313, 315, 318, 322, 334

Thread count, 42, 103, 240, 242, 257, 258

Twill, 34, 225, 227–229

## W

Wool, 5, 10, 29, 37, 42, 56, 58, 62, 81, 87,  
93, 119, 207, 208, 211, 215, 216,  
225, 226, 229, 241, 257, 302, 303,  
311, 334

# Funerary Aspects Index

## B

Bier, 94, 121, 199–201, 236, 244

Body support, 333, 337

Body wrapping, 11–12, 14, 138, 142–144,  
146–148, 150, 151, 157, 182, 194, 198,  
279, 282, 305

## C

Coffin, 12, 35, 65, 80, 97, 117, 137, 142, 176,  
245, 284

Cremation, 18, 37–40, 46, 48, 54, 55, 60, 61,  
66, 67, 207, 210, 214, 224, 255–257,  
259, 265

## I

Inhumation, 3, 5, 10, 11, 14, 15, 17, 41, 43,  
44, 48, 119, 137–161, 172, 201–203,  
255, 256, 258, 259, 263, 265, 267, 283,

285, 288, 290, 300, 302, 307, 308, 311,  
312, 338

## M

Mummification, 13, 57, 87, 98, 114, 119, 138,  
143, 144, 146

Mummy, 13, 35, 36, 138, 139, 143, 149, 152,  
156, 160, 327

## N

Naturally mummified, 14, 16, 19, 126, 280,  
283, 284, 286, 288, 294, 302

## S

Skeleton, 4, 11, 14, 176, 178, 182, 199,  
224, 238, 244, 283, 285, 293,  
295, 306

# Geographical Locations Index

## E

### Europe (sites)

#### Austria

- Asparn an der Zaya, 37
- Berg/Attergau, 39–41
- Bischofshofen-Pestfriedhof, 37
- Carnuntum, 36
- Frauenberg near Leibnitz, 32, 33
- Gemeinlebarn, 38
- Göttweig, 45
- Hallstatt, 38–40, 46
- Hollenburg, 34
- Mannersdorf, 42
- Mautern-Melkerstrasse, 33
- Pottenbrunn, 47
- Schrattenberg, 42
- Schrattendorf, 42
- St. Martin im Lungau, 30
- Tulln, 38
- Wels (Ovilava), 34

#### Crete

- Pankalochori, 245
- Pygi Rethimnou, 245

#### Denmark

- Borum Eshøj, 12
- Egtved, 12
- Huldremose, 12
- Muldbjerg, 12

#### Finland

- Haukipudas, 98–100, 103, 104, 106, 107
- Keminmaa, St Michael church, 99
- Kempele, 98
- Tornio, 98
- Vihti, Kourla Chapel, 99

### Germany

- Eberdingen-Hochdorf, 34, 39, 45, 69
- Horath, 40

### Greece

- Argos, 18, 209, 235–246
- Deiras cemetery (Argos), 235–237
- Dendron, 245, 246
- Eleusis, 210
- Kazarma, 244
- Kerameikos cemetery (Athens), 211
- Lefkandi (Toumba cemetery), 207
- Malthi, 244
- Odos Thevon, 212–214
- Routsi, 244
- Vergina, 46

### Italy

- Osteria dell'Osa, 35
- Veio, 37
- Vetulonia, 37

### Poland

- Gniewkowo, St Nicholas and St Constance church, 80
- Gniew, St Nicholas church, 82
- Końskowola, church of the Discovery of the Holy Cross and St Andrew the Apostle church, 82, 89
- Lubiń, 81, 90
- Lublin, 81
- Piaseczno, church of the Nativity of the Blessed Virgin Mary, 82
- Szczuczyn, church of the Name of the Holy Virgin, 86
- Toruń, 80, 81, 93, 225
- Trzcianka, 18, 221–230
- Warsaw, 2, 81

Europe (sites) (*cont.*)

## Portugal

Beja, 255, 265–267

Vinha das Caliças, 260, 265, 266

## Slovakia

Nové Zámky, 42

## Spain

Alcantarilla, 256, 257

Carmona, 256

Huelva, 256, 258

La Angorrilla, 255, 256, 258–266

La Joya, 256, 258

Lower Andalusia, 254, 256, 259, 267

Medellín, 255, 267–269

Punic Cádiz, 256

**O**

## Outside Europe (countries and sites)

Argentina, 64

Benin, 64

Bolivia, 57

Brasil

Southern Mato Grosso, 66

Burundi, 58

Canada

Anvik, Alaska, 68

Central Asia, 58

China

Hohhot, Inner Mongolia Autonomous Region, 62

Ordos Desert, Inner Mongolia

Autonomous Region, 64

Democratic Republic Of Congo

Ituri forest, 57

Egypt

Abu Rowash, 141

Abusir, 140, 141

Bahr el-Gharaq, 119

Dahshur, 139–141

Deir el-Malak Gabriel, 119

el-Fustat, 140

Fayoum, 119

Gebelein, 317, 326

Giza, 140

Haraga, 156

Meidum, 141

Memphis, 139–141, 144

Naqlun, 16, 117–134

Riqqa, 156

Saqqara, 17, 137–160, 325, 326

## Guatemala

El Palmar, 62

## India

Andaman Islands, 68

Bastar State, 64

Lushai Mountains of Mizoram, 61

## Indonesia

Berastagi, 54

Sumatra, 54, 56

Yos Sudarso Island, 66

Kenya, 64

Mali

Mopti region, 63

## Mongolia

Ulaanbaatar, 61

Morocco, 58

Mozambique

Rikatla, 67

Nigeria, 64

Papua New Guinea, 64

Philippines, 64

Samoa, 59

Siberia

Kamchatka Province, 59

South Korea

Kanghwa island, 63

Sudan

Debeira, 2–12

Dongola/Old Dongola (kom H, Northwest Annex), 16, 117–134, 168–170, 195, 196, 198, 200, 203, 281

Gebel Adda, 12, 17, 167–203

Sai Island, 281–285, 289, 293, 294, 296–298, 307, 309, 310, 313, 314

Suriname

Southwest Saramaka, 64

Tanzania

Lake Eyasi, 57

United States of America (USA), 133

Venezuela

Capanaparo River, 58

Vietnam, 65

# Names Index

## E

### Ethnography

- Anvik Ingalik people, Anvik, Alaska, 68
- Azande people, Sueh Valley, Sudan, 66
- Barundi people, Burundi, 58
- Berbers, Morocco, 58
- 'Bison Horn Maria' clan, Bastar State, India, 64
- Chipewyans of the Central Canadian Subarctic, 66
- Chukchee people, Eastern Siberia, 64
- Dogon people, Mopti region, Mali, 63
- Fellahin, Upper Egypt, 64
- Fon people, Benin, 64
- Hadza people, Lake Eyasi, Tanzania, 57
- Hohhot inhabitants, Inner Mongolia Autonomous Region, China, 62
- Hopi people, USA, 64
- Ifugao people, Philippines, 64
- Igbo people, Nigeria, 64
- Kanghwa inhabitants, Kanghwa island, South Korea, 63
- Kazakhs, Central Asia, 58, 67
- Kimam people, Yos Sudarso Island, South Papua, Indonesia, 66
- Kyrgyz people, Central Asia, 58, 59
- Luo people, South Kavirondo, Kenya, 64
- Mara people, Lushai Mountains of Mizoram, India, 61
- Mataco people, Argentina, 64
- Mbuti archers, Ituri forest, Democratic Republic of Congo, 57
- Mongols, Ordos Desert, Inner Mongolia Autonomous Region, China, 64

- Mongo people, upper Congo River, Democratic Republic of Congo, 66
- Mossi people, Burkina Faso, 64
- Navajo nation, USA, 62
- Nyakyusa people, southern Tanzania, 66
- Orokaiva people, Northern District, Papua New Guinea, 64
- Pastoralists of Mongolia, Ulaanbaatar area, 61
- Pumé (Yaruros) people, Capanaparo River, Venezuela, 58
- Quiché Maya of El Palmar, Guatemala, 62
- Reindeer and Maritime Koryaks, Kamchatka Province, Eastern Siberia, 59
- Samoa people, Samoa, 59
- Sarakatsani nomads, Greece, 63
- Shilluk people, Sudan, 58
- Sirionó people, eastern lowlands of Bolivia, 57
- Terena people, Southern Mato Grosso, Brasil, 66
- Tsonga people, Rikatla, Mozambique, 67

## H

### Historic figures

- Apakyre, Nubian King (14th c. CE), 203
- Banu al-Kanz people, Sudan, 168
- Banu Ikrima people, Upper Egypt, 168
- Djoser, pharaoh (3rd dynasty), 141
- Gapoiapa, Nubian Court Dignitary (14th c. CE), 203



Historic figures (*cont.*)

Georgios, archbishop of Dongola (d. 1113 CE), 123  
 Izabela of the Têczyńskis, wife of Łukasz Opaliński (d. 1667), 83  
 Jan Gniński, bishop of diocese of Kamianets-Podilskyi (d. 1715), 90  
 Jean Revel, textile designer (1684-1751), 90  
 Komar, Nubian Court Dignitary (14th c. CE), 196  
 Konstancja Potocka Szczuczyna, Lithuanian Vice-Chancellor (d. 1733), 82

Łukasz Opaliński, district governor (d. 1662), 83  
 Merefnebef, vizier (5th-6th dynasty), 141  
 Nikolaus Rungius (c. 1560-1629), 100, 107  
 Nyankhnefertem, overseer (5th-6th dynasty), 141  
 Philip II, king of Macedonia (d. 336 BCE), 46  
 Wah, administrator, Theban region (Middle Kingdom), 13